This project was to study an effective learning method to instruct health informatics education through a personalized learning platform. Due to the funding requirement for the project period (shorten from 3 year project to 1 year project), the following project activities listed/highlighted in pink in Table 1 were proposed to accomplish during the project period (7/1/2013-6/30/2014). The work completed and the key results are reported in the second column and some modifications to the activities planned are reported in the notes column.

**Work completed:**
The major accomplishments of this project were to review major healthcare informatics competencies and identified 10 core topics to be included in the UK informatics courses (Appendix A and Appendix B). In addition, the learning objectives and the informatics tools and applications that were to be taught in the informatics class were identified (Appendix C). In order to deliver the research accomplishments during the limited project period, the project selected one major topic-personal health records (PHR) out of 10 core topics for further development. Based on this decision, the course materials such as lecture slides, quiz questions, etc. were developed to instruct the PHR related contents (Appendix F). Four separate surveys to assess individuals’ learning in the area of health and informatics literacy were conducted using mTurk crowd sourcing services. Although these studies could not conduct with UK undergraduate students as planned, three research papers were developed based on these four surveys collected. One student worker who participated in this project was successfully recruited.

**Key results:**
Two research studies (Appendix G) were conducted using mTurk surveys during this project period. Yet, these studies could not confirm/validation the importance of informatics education in this study setting due to limited study scope. Only the PHR education was tested in the studies’ survey setting. In addition, the results are limited within the mTurk survey population (rather than UK college students) in the PHR application area. Further studies are to be conducted in a classroom setting.
**Lessons learned:**
This project was planned to assess whether health informatics education could improve individual student’s health literacy (or competency). Due to the limited project scope, the project were only focused on a selected informatics education module, personal health records management (PHRs). Within this scope, this project learned that informatics competency in health science educations were very limited in UK’s informatics education. There has been very limited informatics courses offered in UK healthcare colleges. In fact, teaching informatics tools and applications for use in healthcare clinics (or education) settings has been very limited for UK students. In addition, the most important lesson learned from this project was there is no widely acceptable informatics literacy standard for college students. The self-reporting survey items to measure individual’s literacy was tested in this project in addition to the literacy test (RTI and SJK literacy assessments in Appendix H) but the validation of these tests were needed with college students.

**Items helpful to colleagues:**
The following items listed in the Appendix A through H would be helpful for those who design health informatics education at the introductory level. In addition, the study instruments such as surveys measuring health literacy would be helpful for those who conduct health literacy research.

**Conclusions:**
This project was intended to develop instructional materials and test whether the developed materials are helpful to improve health literacy among college students. In addition, the original project plan was to provide personalized leaning depending on a level of informatics literacy assessed. Due to the shorten project scope, this project accomplished to review existing learning competency and developed the partial course materials. However, this project yielded three research papers (2 in review and 1 in prep) and two grant proposals (1 external and 1 internal) based on the preliminary results collected through literacy surveys. The course on the clinical informatics was also developed and the proposal is under review. Further studies will be followed up and the full scale tests will be conducted as soon as the findings are secured.
<table>
<thead>
<tr>
<th>Project Activities Planned</th>
<th>Work completed and Key results</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Collect/review learning module topics</td>
<td>Leaning modules were reviewed and 10 core modules selected were described in Appendix A.</td>
<td>Only 10 modules were included.</td>
</tr>
<tr>
<td>2. Collect/review core competencies</td>
<td>Healthcare colleges’ core informatics competencies were reviewed and the individual items based on 10 core learning modules identified were mapped into four categories of the competencies in Appendix B.</td>
<td>American Medical Informatics Core Competency (AMIA Core), and Sub-core were in the first two columns. Nursing and Public Health competencies were also mapped in the third and fourth columns.</td>
</tr>
<tr>
<td>3. Collect/review tools and applications</td>
<td>Core tools and applications were identified for use in the 10 learning modules in Appendix C.</td>
<td>The tools and applications identified were mostly open-source and freely available.</td>
</tr>
<tr>
<td>4. Preparing/obtaining IRB approval</td>
<td>The IRB application was completed with one minor revision to collect additional surveys through mTurk service.</td>
<td>Two studies were conducted to collect pilot data about individual’ literacy on healthcare application such as personal health record management system.</td>
</tr>
<tr>
<td>5. Recruiting/training student assistants</td>
<td>One research assistant was recruited and trained to help on the project. The student’s report is included in Appendix D.</td>
<td>One undergraduate student was recruited with the help of the project support staffs. Recruitment was very successful thanks to the project support staff.</td>
</tr>
<tr>
<td>6. Preparing &amp; installing S/W, H/W</td>
<td>Camtasia studio was installed and used to record the lecture slides.</td>
<td>Only limited software was used in this project period due to the limited project scope.</td>
</tr>
<tr>
<td>7. Programming a Web portal to administer the selected informatics tools and applications</td>
<td>Blackboard was chosen to upload course materials developed. The BB shell was created as Personalized Informatics Education (INFORMATICS-ED-201499-NC).</td>
<td>Due to limited programming skills and time assigned for this project, the Blackboard was chosen to upload the course materials.</td>
</tr>
<tr>
<td>8. Develop learning modules including tutorials, quizzes, review materials, etc.</td>
<td>Among 10 core topics, the personal health records (PHR) was chosen a topic to be further developed in this project period. One lecture slide with audio recorded was developed. In addition, 21 HealthVault videos and 20 college health essential videos were identified/uploaded in the BB course shell. Appendix E: What is PHR?</td>
<td>Due to limited the project scope, the PHR related course materials such as lecture slides, quizzes, and assignments were developed.</td>
</tr>
<tr>
<td>9. Pilot-testing the portal and informatics assessment items with UK undergraduate through survey and interview</td>
<td>The mTurk surveys were conducted and collected from ~600 participants. Appendix F describes two study results under review for publication.</td>
<td>The project pursued to distribute the informatics assessment items to general public (mTurk participants) instead of UK undergraduate students.</td>
</tr>
<tr>
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</tr>
<tr>
<td>10. Refine the tool and learning module based on comments from faculty and students</td>
<td>Not in the project scope</td>
<td></td>
</tr>
<tr>
<td>11. Mapping items from core competencies to individual modules developed</td>
<td>Appendix B includes the mapping results.</td>
<td></td>
</tr>
<tr>
<td>12. Training enrolled students with the module developed</td>
<td>Not in the project scope</td>
<td></td>
</tr>
<tr>
<td>13. Pre-testing informatics competency before the informatics training is given</td>
<td>Not in the project scope</td>
<td></td>
</tr>
<tr>
<td>14. Developing informatics competency evaluation kit to be used for comparison (pre/post analysis)</td>
<td>Four surveys which include competency (literacy) assessments and general surveys were conducted. Appendix G.</td>
<td>The surveys developed were measured how much progress were shown after informatics education (stimuli) were applied. The limited level of evaluation studies were conducted at the preliminary data collection stage.</td>
</tr>
<tr>
<td>15. Post-testing informatics competency after the training is given</td>
<td>Not in the project scope</td>
<td></td>
</tr>
<tr>
<td>16. Collecting/Analyzing the competency score from pre/post evaluation kit</td>
<td>Not in the project scope</td>
<td></td>
</tr>
<tr>
<td>17. Evaluating study findings &amp; delivering study outcomes (conference, seminars etc.)</td>
<td>Not in the project scope</td>
<td></td>
</tr>
<tr>
<td>18. Preparing and submitting manuscripts to peer-reviewed journals</td>
<td>Not in the project scope</td>
<td></td>
</tr>
<tr>
<td>19. Evaluating project performance</td>
<td>Not in the project scope</td>
<td></td>
</tr>
<tr>
<td>20. Planning for further extension and validation for extramural grant</td>
<td>Not in the project scope</td>
<td></td>
</tr>
</tbody>
</table>
# Appendix A:

## Selected Modules and Learning Objectives

<table>
<thead>
<tr>
<th>Module</th>
<th>Topic</th>
<th>Learning Objectives</th>
</tr>
</thead>
</table>
| 1 | Overview of Health Informatics | • To analyze how historical events have influenced the definition and current scope of the practice of health informatics in healthcare.  
• To discuss the development of health informatics as a discipline, profession, and specialty.  
• To discuss informatics-related professional organizations and their contributions to professional development and informatics. |
| 2 | Biomedical Data, Information, and Knowledge | • To be able to compare and contrast the various definitions of health care information  
• To be able to describe the major types of health care information that are captured or used or both in health care organizations  
• To be able to cite specific examples of the major types of health care information. |
| 3 | Electronic Health Records | • To discuss the terms and definitions associated with the electronic health record (EHR).  
• To describe the essential components and attributes of an EHR.  
• To define Meaningful Use in the context of EHR adoption and the impact on health practitioners.  
• To examine EHR applications used in the clinical setting.  
• To analyze the benefits of an EHR related to cost, access, quality, safety, and effectiveness.  
• To evaluate stakeholder perspectives and key issues that affect EHR adoption.  
• To explore future directions for EHR adoption and integration. |
| 4 | Biomedical Data Standards | • To review medical ontologies of particular relevant to clinical practice, research, and education.  
• To understand ontology development and knowledge representation  
• To review the characteristics of major ontologies used in medicine  
• To discuss how ontologies are integrated in and made accessible through knowledge repositories and their role in clinical practice and research  
• To understand the foundation of biomedical natural language processing and its common uses for extracting and transforming narrative information in EHR to support clinical practice and research |
| 5 | Health Information Privacy & Security | • Distinguish among common terms in this area of informatics: privacy, confidentiality, security, covered entity, and data integrity.  
• Analyze current federal and state laws and regulations and their implications for privacy and security practices and procedures.  
• Use appropriate resources in establishing and implementing security- and privacy-related policies and procedures. |
<table>
<thead>
<tr>
<th>Chapter</th>
<th>Topic</th>
<th>Overview</th>
</tr>
</thead>
</table>
| 6       | Consumer Health Informatics | To discuss the characteristics of online healthcare consumers.  
To analyze the implications of ePatients on clinical practice.  
To identify technologic innovations likely to be used in routine practice by clinicians when caring for patients in the future. |
| 7       | Personal Health Records | To analyze the trends and events leading to the development and adoption of electronic personal health records (PHRs).  
To describe the ideal PHR and its proposed benefits.  
To explain the different types of PHRs, including the pros and cons of each type of PHR.  
To provide examples of existing PHRs including their function and use.  
To evaluate current research and other evidence regarding the effectiveness of PHRs as an approach to improving healthcare.  
To explore issues effecting the adoption and function of current PHRs.  
To examine the future of PHRs. |
| 8       | Evidence-Based Medicine | To explore the trend in evidence-based quality improvement in terms of implications for all levels of healthcare organizations and across all professions.  
To review effective models in structuring evidence-based practice (EBP) initiatives.  
To identify informatics-based resources for increasing evidence-based quality improvements.  
To discuss the role of EBP in developing informatics-based solutions for managing patients’ care needs. |
| 9       | Biomedical Imaging Informatics | To discuss basic concepts and issues in biomedical imaging  
To review the field of biomedical imaging informatics as the study of methods for generating, manipulating, managing, and integrating images in biomedical applications  
To review the workflows of imaging intensive fields such as radiology or pathology or nuclear medicine which require imaging informatics applications in their practice and research  
To discuss current issues pertinent to multimedia medical record systems  
To discuss current issues and future developments with imaging informatics applied in clinical research and practice |
| 10 | Bioinformatics | • To review genomic information feeds into clinical research  
• To review molecules that form the blueprint of life and discuss the surrounding research methodologies  
• To discuss how genetic data are clinically integrated  
• To relate how this new type of data is used in different clinical research domains  
• To review basic concepts such as sequence, structure, and biological pathway information relevant to medicine  
• To discuss computational challenges in bioinformatics for the future |
# Appendix B:

**Healthcare Colleges’ Core Informatics Competencies by Learning Modules**

<table>
<thead>
<tr>
<th>Module</th>
<th>Topic</th>
<th>AMIA Core</th>
<th>AMIA Sub-Core</th>
<th>Nursing</th>
<th>Public Health</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Overview of Health Informatics</td>
<td>1, 2</td>
<td>A2.1, A2.2, A2.3, A3.1, A3.2, A3.3, B1, B2, B3, B4, B5</td>
<td>K1, S2</td>
<td>A1, A2, A3, A4</td>
</tr>
<tr>
<td>2</td>
<td>Biomedical Data, Information, and Knowledge</td>
<td>1, 2</td>
<td>A2.1, A2.2, A2.3, A3.1, A3.2, A3.3, B1, B2, B3, B4, B5</td>
<td>K2</td>
<td>A1, A2, A3, A4</td>
</tr>
<tr>
<td>3</td>
<td>Electronic Health Records</td>
<td>2, 3, 4, 5</td>
<td>C1, C.2.8, D1, D2.1, D2.2., D2.3, D2.4, D2.5, D3.1, D3.2, D3.3, D3.4, D3.5</td>
<td>K2, K3, K5</td>
<td>S3, S4, S5, S6, S7, S8</td>
</tr>
<tr>
<td>4</td>
<td>Biomedical Data Standards</td>
<td>2, 3, 4, 5</td>
<td>A2.3, A2.4, A3.1, A3.2, A3.3, B3, B4, C2.2, C2.5, C2.6, C2.8</td>
<td>K1, K3</td>
<td>S1, S2</td>
</tr>
<tr>
<td>5</td>
<td>Health Information Privacy &amp; Security</td>
<td>2, 3, 4, 5</td>
<td>A2.3, A2.4, A3.1, A3.2, A3.3, B1, B5, C1, C2.4, C2.7, D1, D2.1, D2.2., D2.3, D2.4, D2.5, D3.1, D3.2, D3.3, D3.4, D3.5</td>
<td>K4, K5</td>
<td>S1, S2</td>
</tr>
<tr>
<td>6</td>
<td>Consumer Health Informatics</td>
<td>2, 3, 4, 5</td>
<td>C1, C2.2, C.2.8,C3.1., C3.2, C3.3, D1, D2.1, D2.2., D2.3, D2.4, D2.5, D3.1, D3.2, D3.3, D3.4, D3.5</td>
<td>K1, K2</td>
<td>S6, S7, S8</td>
</tr>
<tr>
<td>7</td>
<td>Personal Health Records</td>
<td>2, 3, 4, 5</td>
<td>C1, C2.2, C.2.8,C3.1., C3.2, C3.3, D1, D2.1, D2.2., D2.3, D2.4, D2.5, D3.1, D3.2, D3.3, D3.4, D3.5</td>
<td>K1, K4, K5</td>
<td>S3, S4, S5</td>
</tr>
<tr>
<td>8</td>
<td>Evidence-Based Medicine</td>
<td>2, 3, 4, 5</td>
<td>A3.1, A3.2, A3.3, B1, B2, B3, B4, B5</td>
<td>K2</td>
<td>S1, S2, S6, S7, S8</td>
</tr>
<tr>
<td>9</td>
<td>Biomedical Imaging Informatics</td>
<td>2, 3, 4, 5</td>
<td>A2.3, A2.4, A3.1, A3.2, A3.3, B3, B4, C2.1, C2.2, C2.3, C2.6, C2.8</td>
<td>K4, K5 S6, S7, S8 A1, A2</td>
<td>E, I,</td>
</tr>
<tr>
<td>10</td>
<td>Bioinformatics</td>
<td>2, 3, 4, 5</td>
<td>A2.1, A2.2, A2.3, A2.4, A3.1, A3.2, A3.3, B4, B5, C1, C2.3, C2.6, C2.7</td>
<td>K4, K5 S6, S7, S8 A1, A2</td>
<td>I, J, K</td>
</tr>
</tbody>
</table>
AMIA Core Competency

American Medical Informatics Association (AMIA)’s Biomedical Informatics Core Competencies

http://www.amia.org/biomedical-informatics-core-competencies

(Note: This competency document is slightly reordered and numbered to organize it for the better representation of the competencies.)

Core Competencies in Biomedical Informatics
(Fundamental Scientific Skills)

1. **Acquire professional perspective**: Summarize and explain the history and values of the discipline and its relationship to related fields while demonstrating an ability to read, interpret, and critique the core literature

2. **Analyze problems**: Analyze, understand, abstract, and model a specific biomedical problem in terms of data, information and knowledge components

3. **Produce solutions**: Use the problem analysis to identify and understand the space of possible solutions and generate designs that capture essential aspects of solutions and their components

4. **Articulate the rationale**: Defend the specific solution and its advantage over competing options

5. **Implement, evaluate, and refine**: Demonstrate an ability to carry out the solution, to assess its validity, and iteratively improve its design

6. **Innovate**: Create new theories, typologies, frameworks, representations, methods, and processes to address biomedical and informatics problems

7. **Work collaboratively**: Demonstrate the ability to team effectively with partners from diverse disciplines

8. **Disseminate and discuss**: Communicate effectively to audiences in multiple disciplines in persuasive written and oral form

**Definition of Biomedical Informatics**

Biomedical informatics (BMI) is the interdisciplinary field that studies and pursues the effective uses of biomedical data, information, and knowledge for scientific inquiry, problem solving and decision making, motivated by efforts to improve human health.

Corollaries:

A. BMI investigates and supports reasoning, modeling, simulation, experimentation and translation across the **spectrum from molecules to populations**, dealing with a variety of biological systems, bridging basic and clinical research and practice, and the healthcare enterprise.

B. BMI develops, studies and applies **theories, methods and processes** for the generation, storage, retrieval, use, and sharing of biomedical data, information, and knowledge.

C. BMI builds on **computing, communication, and information sciences** and technologies and their application in biomedicine.

D. BMI, recognizing that people are the ultimate users of biomedical information, draws upon the **social and behavioral sciences** to inform the design and evaluation of technical solutions and the evolution of complex economic, ethical, social, educational, and organizational systems.
Sub-Competencies in Biomedical Informatics

A. Scope and Breadth of the Discipline
BMI investigates and supports reasoning, modeling, simulation, experimentation, and translation across the spectrum from molecules to populations, dealing with a variety of biological systems, bridging basic and clinical research and practice, and the healthcare enterprise.

1. **Prerequisite knowledge and skills:** Basic familiarity with biological, biomedical, and population health concepts and problems including common research problems

2. **Fundamental knowledge:** Understand the fundamentals of the field in the context of the effective use of biomedical data, information, and knowledge. For example:
   2.1. Biology: molecule, sequence, protein, structure, function, cell, tissue, organ, organism, phenotype, populations
   2.2. Translational and clinical research: genotype, phenotype, pathways, mechanisms, epigenetics, sample, protocol, study, subject, evidence, evaluation
   2.3. Healthcare: screening, diagnosis (diagnoses, test results), prognosis, treatment (medications, procedures), prevention, billing, patient, consumer, provider, families, healthcare teams, quality assurance, safety, error reduction, comparative effectiveness, medical records, personal health records, information security and privacy
   2.4. Population health: detection, prevention, screening, education, stratification, spatiotemporal patterns, ecologies of health, populations

3. **Procedural knowledge and skills:** For substantive problems related to scientific inquiry, problem solving, and decision making, analyze and critically evaluate solutions based on biomedical informatics approaches
   3.1. Frame complex biomedical informatics problems in terms of data, information, and knowledge
   3.2. Analyze, select, apply, and evaluate biomedical informatics methods
   3.3. Relate such knowledge to other problems within and across levels of the biomedical spectrum

B. Theories and Methodology
BMI develops, studies and applies theories, methods and processes for the generation, storage, retrieval, use, and sharing of biomedical data, information, and knowledge.

All involve the ability to reason and relate to health information, concepts, and models spanning molecules to populations:

1. **Theories:** Understand and apply syntactic, semantic, cognitive, social, and pragmatic theories as they are used in biomedical informatics
2. **Typology:** Explain and analyze the types and nature of biomedical data, information, and knowledge
3. **Frameworks:** Describe and apply the common conceptual frameworks that are used in biomedical informatics
   3.1. A framework is a modeling approach, programming approach, representational scheme, or an architectural design
4. **Representation:** Understand and apply representations and models that are applicable to biomedical data, information, and knowledge
   4.1. A representation is a method of using data structures or semantic elements in a computational environment
5. **Methods and processes:** Recognize and apply the methods and processes used in different contexts of biomedical informatics

C. Technological Approach
BMI builds on computing, communication and information sciences and technologies and their application in biomedicine.

1. **Prerequisite knowledge and skills:** Assumes basic familiarity with data structures, algorithms, programming, mathematics, statistics

2. **Fundamental knowledge:** Understand and gain experience applying the fundamentals of the field in the context of biomedical problems. For example:
   2.1. Imaging and signal analysis
   2.2. Information documentation, storage, and retrieval
   2.3. Machine learning, including data mining
   2.4. Networking, security, databases
   2.5. NLP, semantic technologies
   2.6. Representation of logical and probabilistic knowledge and reasoning
   2.7. Simulation and modeling
   2.8. Software engineering

3. **Procedural knowledge and skills:** For substantive problems, understand and apply methods of inquiry and criteria for selecting and utilizing algorithms, techniques, and methods
   3.1. Describe what is known about the application of the fundamentals within biomedicine
   3.2. Identify the relevant existing approaches for a specific biomedical problem
   3.3. Apply, adapt, and validate an existing approach to a specific biomedical problem

D. Human and Social Context

BMI, recognizing that people are the ultimate users of biomedical information, draws upon the social and behavioral sciences to inform the design and evaluation of technical solutions and the evolution of complex economic, ethical, social, educational, and organizational systems.

1. **Prerequisite knowledge and skills:** Familiarity with fundamentals of social, organizational, cognitive, and decision sciences

2. **Fundamental knowledge:**
   2.1. Design: human centered design, usability, human factors, cognitive and ergonomic engineering
   2.2. Evaluation: controlled trials, observational studies, hypothesis testing, ethnographic methods, field observational methods
   2.3. Social, behavioral and organizational sciences: Computer Support for Collaborative Work, Social Networks, change management
   2.4. Ethical, Legal, Social Issues: human subjects, HIPAA, informed consent, secondary use of data, confidentiality, privacy
   2.5. Economic, social and organizational context of biomedical research, pharmaceutical industry, medical instrumentation, healthcare, and public health

3. **Procedural knowledge and skills:** Develop systems approaches to the solution of substantive problems in biomedical informatics
   3.1. Frame complex biomedical informatics problems in terms of people, organizations, and socio-technical systems
   3.2. Understand the challenges and limitations of technological solutions
   3.3. Design, implement, and validate the biomedical informatics applications and interventions
3.4. Evaluate the impact of biomedical informatics applications and interventions in terms of people, organizations, and socio-technical systems
3.5. Relate solutions to other problems within and across levels of the biomedical spectrum
Quality and Safety Education for Nurses (QSEN) for Pre-Licensed
http://qsen.org/competencies/pre-licensure-ksas/#informatics
(Note: This competency document is slightly reordered and numbered to organize it for the better representation of the competencies.)

**INFORMATICS**

**Definition:** Use information and technology to communicate, manage knowledge, mitigate error, and support decision making.

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>Skills</th>
<th>Attitudes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>K1.</strong> Explain why information and technology skills are essential for safe patient care</td>
<td><strong>S1.</strong> Seek education about how information is managed in care settings before providing care</td>
<td><strong>A1.</strong> Appreciate the necessity for all health professionals to seek lifelong, continuous learning of information technology skills</td>
</tr>
<tr>
<td><strong>K2.</strong> Identify essential information that must be available in a common database to support patient care</td>
<td><strong>S2.</strong> Apply technology and information management tools to support safe processes of care</td>
<td><strong>A2.</strong> Value technologies that support clinical decision-making, error prevention, and care coordination</td>
</tr>
<tr>
<td><strong>K3.</strong> Contrast benefits and limitations of different communication technologies and their impact on safety and quality</td>
<td><strong>S3.</strong> Navigate the electronic health record</td>
<td><strong>A3.</strong> Protect confidentiality of protected health information in electronic health records</td>
</tr>
<tr>
<td><strong>K4.</strong> Describe examples of how technology and information management are related to the quality and safety of patient care</td>
<td><strong>S4.</strong> Document and plan patient care in an electronic health record</td>
<td><strong>A4.</strong> Value nurses’ involvement in design, selection, implementation, and evaluation of information technologies to support patient care</td>
</tr>
<tr>
<td><strong>K5.</strong> Recognize the time, effort, and skill required for computers, databases and other technologies to become reliable and effective tools for patient care</td>
<td><strong>S5.</strong> Employ communication technologies to coordinate care for patients</td>
<td></td>
</tr>
</tbody>
</table>
REFERENCE 3:
Competencies for Public Health Informaticians, 2009 by Center for Disease Control (CDC)


Core Competencies for Public Health Informaticians

A. Supports development of strategic direction for public health informatics within the enterprise.
B. Participates in development of knowledge management tools for the enterprise.
C. Uses informatics standards.
D. Ensures that knowledge, information, and data needs of project or program users and stakeholders are met.
E. Supports information system development, procurement, and implementation that meet public health program needs.
F1. Manages IT operations related to project or program (for public health agencies with internal IT operations).
F2. Monitors IT operations managed by external organizations.
G. Communicates with cross-disciplinary leaders and team members.
H. Evaluates information systems and applications.
I. Participates in applied public health informatics research for new insights and innovative solutions to health problems.
J. Contributes to development of public health information systems that are interoperable with other relevant information systems.
K. Supports use of informatics to integrate clinical health, environmental risk, and population health.
L. Implements solutions that ensure confidentiality, security, and integrity while maximizing availability of information for public health.
M. Conducts education and training in public health informatics.
## Appendix C:
**Tools and Applications by Learning Modules**

<table>
<thead>
<tr>
<th>Module</th>
<th>Topic</th>
<th>Tools and Applications</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Biomedical Data, Information, and Knowledge</td>
<td>RedCap – Data Collection</td>
<td>• <a href="http://ccts.uky.edu/BIC/RedCap.aspx">http://ccts.uky.edu/BIC/RedCap.aspx</a></td>
</tr>
<tr>
<td>3</td>
<td>Electronic Health Records</td>
<td>I2B2 – Clinical Data Warehouse</td>
<td>• <a href="https://ccts.uky.edu/BIC/i2b2.aspx">https://ccts.uky.edu/BIC/i2b2.aspx</a></td>
</tr>
<tr>
<td>8</td>
<td>Evidence-Based Medicine</td>
<td>Critically Appraised Topics (CATs)</td>
<td>• <a href="http://www.cebm.net/?o=1216">http://www.cebm.net/?o=1216</a></td>
</tr>
<tr>
<td>9</td>
<td>Biomedical Imaging Informatics</td>
<td>Code for the Edge Detection and Image SegmentatiON system (EDISON)</td>
<td>• <a href="http://coeww.rutgers.edu/riul/research/code/EDISON/">http://coeww.rutgers.edu/riul/research/code/EDISON/</a></td>
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</tbody>
</table>
Appendix D:

**Personal Health Records (PHR) Assignment**

This assignment is to give you an opportunity to understand different types of healthcare information. This assignment has two parts which include: (Part I) collect and analyze your personal health records and (Part 2) import your PHRs into a web-based PHR system such as WebMD Manager.

**Part I:**

Contact a healthcare facility (hospital, nursing home, physician’s office, or other organization) to ask permission to view a sample of your health records they maintain. If you do not have any healthcare contact for your own records, you can use a sample of record provided for this assignment. To get full credit, please answer the following seven questions: 1) what is the primary reason (or condition) for which the patient was admitted to the hospital?; 2) how long has the patient had this condition?; 3) did the patient have surgery during this admission? If so, what procedure(s) was (were) done?; 4) Did the patient experience any complications during this admission? If so, what were they? 5) How does the physician’s initial assessment of the patient compare with the nurse’s initial assessment? Where in the record would you find this information?; 6) Where was the patient discharged to and in what condition?; and 7) What were the patient’s discharge orders or instructions? Where in the records should you find this information?

**Part 2:**

WebMD Health Manager is an online healthcare tool that offers free services to patients. Patients can manage their health records and take health assessments to determine their medical risks and receive suggestions on how to reduce their chances of developing certain diseases. Although the service is free, additional benefits such as healthcare discounts are only available to patients who log in through their employer. Navigation can be tricky and information is shared between users on a single account. For a free service, patients still get plenty of health and wellness tools in their hands. Besides keeping track of medical records, a website is designed with personalized information based on answers provided during the initial health assessment.

- **Step 1:** Watch a training video which explains how to use WebMD HealthManager.
- **Step 2:** You are asked to create a log-into WebMD HealthManager account.
- **Step 3:** Enter your PHRs that you analyzed in the Part 1 into WedMD Records and Quotient.
- **Step 4:** Write a short essay describing your WebMD experience including pros and cons of PHRs in a web-based commercial, free system, WebMD user interface with relevant to navigation, data entry, search, etc. Your essay should be no more than 2,000 words.
Appendix D:
Student Work report

Since March of 2014, I have assisted Dr. Sujin Kim in multiple projects that pertain to her field of study. One of the first projects dealt with public health concerns that specifically targeted college students. I was given multiple pamphlets with various topics such as STDs, acne, eating disorders, drug/alcohol addiction, tobacco treatment, sleep disorders, and so forth. I read each pamphlet and created questions that students can be tested on. Other than pamphlets, I researched educational videos that informed young adults about the various topics. I chose the videos that I thought were the most effective at delivering information and created numerous questions for each video that students can be quizzed on. There are 26 college health topics that have a description of the video along with questions that follow it. The title of the file containing the questions is named Appendix B- College Health Essentials.

Dr. Sujin Kim and I created a survey that measured the health literacy skills of students. Some of the information was used from my chosen “College Health Essentials” pamphlets and videos that had questions along with it. The other information was in a different format that I had to transcribe so the information was more organizational and could be more effective at educating students. I attached the links and pictures to the document that guided students where to find the answers. The survey had various subjects such as hospital maps, examples of medical records, cholesterol scores, portion sizes for food, nutrition, examples of medical billing statements, injuries such as burns and broken bones, and information on signs of stroke and heart attacks. Students were to read the text and immediately answer questions after. This survey tested students’ Health Literacy Skills so Dr. Kim could have data about their skills.

To personally learn about Dr. Kim’s field of study, I had to educate myself as well as organize the information that can be taught to students. First, I created a PowerPoint that was an introduction to Clinical Informatics. This was an introductory presentation that taught the basics Clinical Informatics such as the definition, how people use clinical informatics, why there is a need by health care professionals to use clinical informatics, where the field is going in the future, and what professional organizations and resources are out there for the clinical informatics field. This was the first lesson Dr. Kim’s students would receive in the class.

I have proofread a few of Dr. Kim’s documents that she needed. Some were documents that described our ongoing projects and I also proofread PowerPoint slides she used for her class. The very first week of I started, I proofread introductory slides about Personal Health Records and Biomedical Informatics as a whole to familiarize myself with the information I would be working on. Along with proofreading, I created an audio recording for the University of Kentucky’s Eye Clinic.

Dr. Sujin Kim sent me video links that taught how a person can set up and use an app called HealthVault. There are 21 instructional videos that instruct how to use
the app and inform its purpose in the health care field. I made a description for each of the 21 videos and uploaded them onto Blackboard for Dr. Kim’s future students. Each video has a short description, a title, a URL link, and a time of the video. I have also uploaded multiple quizzes to Blackboard that are either true/false questions or multiple choice. I have also uploaded tests that will go along with the PowerPoints that were created. The tests have questions that tell students which slide in the PowerPoint that particular question is pertaining to.

As we transitioned into the subject of Personal Health Records, I was given a textbook that described the entire spectrum of PHR’s. I created PowerPoints for each chapter that delivered the information in an effective way. I began with listing the learning objectives for that particular chapter then proceeded with the information. Throughout each chapter, I incorporated 10 questions throughout the presentation that were multiple-choice questions or true/false questions.

The PowerPoints I made had great information, but Dr. Kim and I wanted to deliver the information in a more appealing way for students. I was familiar with the website Prezi and decided to generate Prezi videos using the information from the PowerPoints. I generated five Prezi videos, Lesson 1: Overview of Health Informatics, Introduction to Clinical Informatics, Personal Health Records (PHRs) and its Management, Lesson 2: Biomedical Data, Information, and Knowledge, Personal Health, and Personal Health Records. These presentations are more abstract and appealing to learn from.

More recently, I began creating PowerPoints for 15 different chapters from a textbook that teaches every aspect of biomedical informatics. I was able to create diagrams that mimicked the textbook, along with flow charts and tables for students to learn the material easier. The PowerPoints have anywhere from 20-35 slides each.

Dr. Kim sent me PowerPoints for her online class that has already been created by her. I have been generating transcripts for the PowerPoints and using a program called Camtasia to record videos of the lecture. Each Week has a Part A and Part B to it. The videos also have closed caption available because I typed the transcript at the very end of the video editing. We have created five weeks worth of videos, each containing a Part A and a Part B.
Learning Module 7: Personal Health Records (PHRds) and its management
Potential Q&A to be addressed?

- What is PHRs? What is PHIs? What is PHIM?
- Where do I go if I can't find the information I need on your Web site? How can I obtain copies of my health record? Why would I want to keep a PHR? Can I access my PHR through my cell phone?
- Am I required to pay for copies of my health record? How can I transfer my health record?
- Do all PHRs need to be documented on a computer? If I don't have access to a computer can I still keep a PHR?
- Do universities offer free PHRs to students?
- Should my PHR include emergency contact information?
- My doctor gave me a Notice of Privacy Practice. What is this and do I have to sign it? When can my health information be shared without my consent?
- Can a hospital share information with my family without my authorization?
- Do I have the right to see my child's health record? Where can I locate the federal and state laws that govern disclosure of my health information?
- What do I do if I believe my health information privacy rights have been violated?
- When can healthcare providers share information from my PHR with my family without my consent? Can my parents view my PHR?
What Is a *Personal Health Record (PHRs)*?

- a record with information about your health that you, or someone helping you, keep for easy reference using a computer.
- You control the health information in your PHR and can get to it anywhere at any time with Internet access.
- PHRs use secure technology to protect your information from being seen without permission.
- You'll get a unique user ID and password.
- You control who can see your information.
Where my health records are stored?

Electronic Health Records (EHRs)

- a digital version of a patient’s paper chart.
- real-time, patient-centered records that make information available instantly and securely to authorized users.
- contain a patient’s medical history, diagnoses, medications, treatment plans, immunization dates, allergies, radiology images, and laboratory and test results
- health information can be created and managed by authorized providers in a digital format capable of being shared with other providers across more than one health care organization.
How EHRs & PHRs Foster Patient Participation?

- EHRs can help providers:
  - Ensure high-quality care.
    With EHRs, providers can also offer follow-up information after an office visit or a hospital stay, such as self-care instructions, reminders for other follow-up care, and links to web resources.
  - Create an avenue for communication with their patients.
    With EHRs, providers can manage appointment schedules electronically and exchange e-mail with their patients. Quick and easy communication between patients and providers may help providers identify symptoms earlier.
What types of PHRs?

- With **standalone PHRs**, patients fill in the information from their own records and memories, and the information is stored on patients' computers or the Internet.

- **Tethered or connected PHRs** are linked to a specific health care organization's EHR system or to a health plan's information system. The patient accesses the information through a secure portal.
Why use PHRs?

- keep all your health information in one place, making it easier to find information about your recent health services and conditions and share it with your providers, caregivers, and family members.
- help providers get the information they need to treat you in an emergency by quickly sharing information on your medications, allergies, and emergency contacts.
- help you avoid getting duplicate procedures or tests, saving you time and money.
- update your PHR and keep your personal (health) information current.
- let you refill prescriptions, schedule appointments, email your doctor, and learn more about your condition and medications.
- Providers and hospitals who use Electronic Health Records (EHRs) sometimes offer a way for you to view your health records online, download the information, and share it with others you trust. In many cases, you can add this information to your PHR.
- may also be able to add your claims data downloaded with Medicare’s Blue Button on MyMedicare.gov to your PHR.
Who offers PHRs?

- Providers, health plans, and private companies.
- Some PHRs are offered for free.
- Some independent companies create and maintain PHRs for you. If you give them permission, they may be able to get your health information from your doctor or health plan.
- If your doctor or health plan doesn't offer a PHR, check what's available from other companies at myPHR.com.
myPHRs

CHOOSE A PHR

The links to PHR tools and resources provided on this website are provided solely for consumers’ information. AHIMA does not warrant the merchantability or fitness for a particular purpose of any of the products or services available through these links. Nor does AHIMA, in any way, endorse, recommend or guarantee those products or services or the vendors who provide them. In no event shall AHIMA be liable for any damages, including direct, indirect, incidental, special, consequential or any other type of damages, arising out of the use of those products or services, even if AHIMA has been advised of the possibility of such damages.

☑ I have read and agree to all of the terms and conditions.

<table>
<thead>
<tr>
<th>FORMAT</th>
<th>COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Web-based</td>
<td>Free</td>
</tr>
<tr>
<td>Software-based</td>
<td>For Purchase</td>
</tr>
</tbody>
</table>

The following providers meet your search criteria:
(click a provider name to visit its website)

http://www.myphr.com/resources/choose.aspx
Is my health information private & secure in a PHR?

- Yes! But!—special permissions or passwords let you choose who can access your PHR so others can get your critical information quickly.
- When you use a PHR, make sure it's on a secure website. Most companies offering PHRs have a secure site to protect and keep your information safe.
- Health plans and most health care providers who offer PHRs must give you a "Notice of Privacy Practices" that says how they keep your personal information private and safe.
- If you don't get a privacy notice, ask for a copy or check your PHR's website.
How to get permission to someone else's PHR (if you're a caregiver)

- By law, *only the patient has the right* to their own health information, even if you're an immediate family member or if you help set up their PHR.
- *The patient needs to submit a written authorization* to their doctors, health care facilities, and health plan for caregivers to get access to their health care information.
- Caregiver authorization needs to be complete and comprehensive—it needs to give the provider (doctor or hospital) *permission to release all information* regarding treatment and care to the patient and/or anyone else designated.
- Some PHR home pages let an individual give permission to other people to use the tool. That person will then get their own user ID and password.
How to manage my PHI?

- Think about three steps below:
  - Collect! – Shall I keep it or not? Do I need it or not?
  - Organize! – How can I keep it? How can I find it?
  - Keep up-to date! – Any updates since my last visit?

- Use paper based folders or PHRs system?
How to manage my PHI?

Step 1: Collect
- Create a separate logins for each family member and the file should Include a medical history, current medications, health status, insurance information, and any information important for health care professionals to know.
- Contact all doctors and health care providers at each facility to ask for current and past information. Complete any authorization forms needed to release the information.

Step 2: Organize
- Sort the medical information into groups, such as Health History, Prescriptions, Insurance, etc.
- Enter information into PHR system. Watch how to use the system before entering your data. Make sure to read and understand information privacy and security information.
- Keep the copy of the most important information such as status of your current condition, provider contact information, medications and treatments, recent tests or procedures, insurance data. Label the tab “Emergency Information”.

Step 3: Update
- When you visit a clinic, add any new information to the file. Update medications lists or health histories to keep all information current.
- Keep track of changes as they occur. Write down what your doctor tells you at each appointment and keep it in the file.
- Store the medical files and login information in a safe but easily accessible place. Take the file with you in an emergency. Bring it with you when you travel and to your scheduled appointments.
What PHI should be kept?

- Contact information for your doctor and a friend or relative.
- Current prescriptions and medications
- Chronic conditions; asthma, diabetes, heart disease, HIV/AIDS, cancer, STDs etc.
- History of illnesses, hospitalizations, surgeries
- Allergies and immunization history
- Family history of high blood pressure, diabetes, strokes, etc.
- A history of the doctor’s appointments
- Calls/conversations you have had with your doctors, insurance companies
- Instructions from health care providers, lab tests, EKG, MRI, ultrasound printouts or other results
- A detailed description of illnesses, hospitalizations, onset of chronic diseases, surgeries, procedures and treatments you have received.
If you are sick, what PHI?

- Make sure to enter the following information into your PHR system.
  - Medical bills you receive from healthcare providers, labs, hospitals.
  - Insurance claims you file with the insurance company.
  - Insurance claims that have been paid by your insurance company.
  - Medical bills you have paid
  - All prescription drug information – past and current.
  - Receipts for out-of-pocket expenses
  - Test results from medical providers.
  - Hospital discharge orders/documents.
  - Make sure to include dates on each treatments, medications, or any services you received.

- Keep an original copy of paper-based records for backup (e.g., use scan or photocopy)
What are sources of PHRs?

<table>
<thead>
<tr>
<th>Category</th>
<th>Sources of Personal Information</th>
<th>Types of Personal Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthcare provider</td>
<td>Alternative medical sources, Clinics or hospitals, copies of medical records, doctor's visits, Commercial laboratories, Electronic Health Record (EHR), Health care providers/doctors, generalists and specialists, clinicians, nurses, pharmacists, physicans, alternative healthcare practitioners, therapists</td>
<td>Clinical encounters, Medical records and information: such as: x-rays, lab results, ECG, discharge summary, medical checkup information, operative notes, treatment regimes, procedure information, surgeries, treatments, doctor's appointment schedule, Medical bills and receipts, medication and prescription information, Allergy data, blood test results, major illness (e.g. medical condition certificates), data entry contact information, Contact information, insurance records</td>
</tr>
<tr>
<td>Healthcare Insurer</td>
<td>Insurers (claims databases - claims history)</td>
<td>Insurance, administrative data and claims data, Financial information related to insurance and claims, Health care providers and contact information, doctor or primary care physician's contact information, hospital or clinic information</td>
</tr>
<tr>
<td>Mass media/Public Institution</td>
<td>Broadcast (radio talk shows, television news programs), Computer-based resources, informational CDs, web, Printed health publications, brochures, health magazines, printed news media, newspapers, news magazines, newsletters, reference books, Hotlines, Intentional sources or sources which give out particular health related information, campaigns, street signs or billboards, Internet, websites, email, Public literary, schools, classes, Public Health Organizations, health groups operating at local, State or national level, national public policy groups, Organized health events, women's health fairs, support groups, resource centers</td>
<td>Instructions on self-care, First aid information, explanation of benefit, Nutrition and diet, Literature, health-related articles and web pages, patient leaflet, pamphlets, books, newsletters, Medical information portals and websites for information collection, Online support groups, communities, online chat logs for support and health information collection</td>
</tr>
<tr>
<td>Others</td>
<td>Patient-sourced data: any data entered by the patient that is not provided by a professional organization, such as a patient diary, over-the-counter medication lists, or medical device data</td>
<td>Patient-keyed data: any data that is provided to the patient by a professional source, Entries and postings on refrigerator door, kitchen cabinets, notes next to telephone, Poison control, cancer surveys, observations, instructions, over-the-counter medications, exercise and diet, self-care logs, Home-monitored data (e.g., BP, glucose, peak flow), logs of symptoms, pedometer data</td>
</tr>
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How much people know about PHRs?

- 2010 survey:
  - More than 50% of people are unaware of PHRs.
  - Up to 76% of people are unaware of telephone applications for tracking health information.

- 2008 survey of rural physicians:
  - More than 25% are unaware of PHRs.
  - Up to 59% are unaware whether patients had or used PHRs.
How people use PHRs?

- Users are disappointed in the:
  - Amount of data available
  - Type of data available
  - Need to enter all the data themselves
  - Limited options for sharing data with clinicians
Any Current Issues with PHRs?

- The Digital Divide:
  - Individuals of lower socioeconomic status, ethnic minorities, and older individuals are less likely to adopt a PHR.

- Interoperability:
  - PHR data and functions are constrained by the systems to which the PHR is linked.
  - Several data representation exchange standards have been developed and proposed to mitigate this concern.
    - Continuity of care record (CCR)
    - Clinical document architecture (CDA)
    - Continuity of care document (CCD)
Any legal issues?

- Law and Policy:
  - State laws sometimes interfere with PHRs:
    - In California, certain results may not be electronically released for any reason.
    - Current laws prohibit healthcare providers from delivering care across state lines.
Barriers to Ideal Personal Health Records

- Current records are not interoperable.
- In some states Current laws prevent full sharing of EHR data and prevent practice of medicine across state lines, limiting the use of PHRs for e-Visits
  - Technical
  - Policy
Future of PHRs?

- Generalizability of current evidence
- Improvements:
  - Expand the scope of data in the PHR.
  - Expand the functionality of the PHR.
Title: Predictors affecting personal health information management skills

Running title: Personal health information management skills

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Keywords

- Personal Health Records
- Personal Information Management
- Principal Component Analysis
- Hierarchical Regression Analysis
ABSTRACT

Objectives: This study investigated major factors affecting personal health records (PHRs) management skills associated with survey respondents’ understanding of health information as well as technology/computer knowledge and skills.

Methods: A self-reporting survey was used to assess individual’s PHR skills and characteristics. Principle Component Analysis with Varimax rotation and hierarchical regressional analyses were used for analyses.

Results: Among personal health information activities surveyed (N=578 respondents), the four extracted factors were subsequently grouped and labeled as: Collecting Skills (Cronbach’s α = .906), Searching skills (Cronbach’s α = .837), Sharing skills (Cronbach’s α = .763), and Implementing skills (Cronbach’s α = .908). In the hierarchical regression analyses, the education and computer knowledge significantly increased the explanatory power of the regression models. Results indicate that health knowledge (β = 0.25, P < 0.001) emerged as a positive predictor of PHR Collecting skills. In addition, both health and computer knowledge (β = 0.18, P < 0.001) were significantly positive predictors of PHR Searching skills.

Conclusions: This study reassured that PHR training and learning should consider a full spectrum of information management skills ranging from collection to retrieval to distribution to use in individuals’ care and prevention continuum.
Development of a Health Literacy Model For Personal Health Records Management Skills

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Keywords

• Personal Health Information Management
• Health Literacy Model
• Partial Least Squares Structural Equation Modeling (PLS-SEM)

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Abstract

This study was to empirically test: whether key constructs adopted from Squires’ framework have any influence on the development of personal health records (PHRs) health literacy skills and which constructs are statistically associated with health-related outcomes. Subjects were recruited from Amazon’s mTurk, a crowdsourcing Internet service. A total of five hundred and seventy-eight questionnaires were analyzed using a partial least squares structural equation modeling (PLS-SEM) technique. Our findings confirm that all constructs tested had strong and adequate reliability and discriminant validity. The model as a whole exhibited 62.8% of a variance in health-related outcomes. The findings suggest that prior knowledge has a direct effect on health

¹ Corresponding author
literacy skills ($H3: \beta=0.212, \ p < 0.001$). While the demands of stimuli ($H4: \beta=0.475, \ p < 0.001$) have a direct impact on health literacy skills, it also has an indirect effect on comprehension of stimuli ($H6: \beta=0.526, \ p < 0.001$) through the mediator of stimuli and the knowledge variable. Meanwhile comprehension of stimuli ($H7: \beta=0.793, \ p < 0.001$) has a strong effect on health-related outcomes. Understanding what determines a patient’s level of literacy and how it relates to health outcomes will advance literacy research by providing reliable measures and a theoretical framework.
APPENDIX A:
Personal Health Information Management Survey

I. Background Information

1. What is your gender?
   a. Male   b. Female

2. What is your age?
   a. 20-25  
   b. 26-30 
   c. 31-40 
   d. 41-65 
   e. 66 or above

3. What is your race/ethnicity that best describe yourself?
   a. White  
   b. Black or African American 
   c. American Indian or Alaska Native 
   d. Asian 
   e. Native Hawaiian/Pacific Islander 
   f. 2+races

4. What is your highest degree earned?
   a. No formal education 
   b. High School 
   c. Associate degree 
   d. Bachelor’s degree 
   e. Master’s degree 
   f. Professional or doctoral degree

5. What is your annual income?
   a. Less than $25,000 
   b. $25,000 - $49,999 
   c. $50,000 - $74,999 
   d. $75,000 - $99,999 
   e. More than $100,000

II. Competency

6. What is your current health status?
   Poor  Excellent  
   0---------------1---------------2---------------3---------------4

7. How would you rate your computer and technology skills/knowledge on a scale of 0: Poor----4: Excellent?
   Poor  Excellent  
   0---------------1---------------2---------------3---------------4

8. How would you rate your understanding of health information on a scale of 0: Poor----4: Excellent?
   Poor  Excellent  
   0---------------1---------------2---------------3---------------4

9. How would you rate your health information management skills on a scale of 0: Poor----4: Excellent?
   Poor  Excellent  
   0---------------1---------------2---------------3---------------4
Knowledge about health content

10. Do you know your blood cholesterol level?  Yes ___ No ___

11. Do you know your blood pressure?  Yes ___ No ___

12. Do you know your fasting blood glucose level?  Yes ___ No ___

13. Do you know your body mass index?  Yes ___ No ___

14. People sometimes have a blood test to measure their cholesterol level. To the best of your knowledge, what is a maximum total blood cholesterol level for someone who is trying to maintain good health? Should it be: (Note: Select only one)
   a. Under 120
   b. Under 160
   c. Under 200
   d. Under 240
   e. Don’t know

15. Doctors talk about two types of cholesterol, one called HDL and one called LDL. Which of the following is true: (Note: Select only one)
   a. Both LDL and HDL need to be kept as low as possible
   b. HDL should be kept high and LDL should be kept low
   c. LDL should be kept high and HDL should be kept low
   d. Both LDL and HDL need to be kept as high as possible.
   e. I am not sure about what doctors recommend about these two

16. Which one of the following is most likely to be associated with an increased risk of cervical cancer?  (Note: Select only one)
   a. Human papilloma virus, or HPV, the sexually transmitted virus
   b. One or more abortions
   c. High blood pressure
   d. A history of regular smoking
   e. Breastfeeding one or more children
   f. Don’t know

General Computer Knowledge subscale

17. Can you name one input device and one output device?  Yes ___ No ___

18. Do you know what RAM stands for and how much RAM your computer has?  Yes ___ No ___

19. Do you know how to use a mouse to “drag” an item?  Yes ___ No ___

20. Do you know the acceptable form for a filename?  Yes ___ No ___

21. Do you know how to reboot your computer?  Yes ___ No ___

Documents and Documentation Subscale

22. Do you know how to right and left justify a document?  Yes ___ No ___

23. Do you know how to cut and paste a block of text?  Yes ___ No ___

24. Do you know the difference between “Insert” and “Type over”?  Yes ___ No ___

25. Do you know how to tell your word processor to paginate?  Yes ___ No ___

26. Can you use a spell checker?  Yes ___ No ___

Data Inquiry (Databases and Search Engines) Skill Subscale

27. In a database, do you know what a record is?  Yes ___ No ___

28. Have you ever used any system/service that manages your health records?  Yes ___ No ___

29. Do you know what difference “AND” or “OR” would make in combining the results of two searches?  Yes ___ No ___

30. Have you ever used a “search engine” (i.e., Google, Yahoo, PubMed, CINAHL)?  Yes ___ No ___

31. Do you know what MeSH stands for and how to use them?  Yes ___ No ___

Communications and Surfing Subscale

32. Do you have an Internet provider for your home or office computer?  Yes ___ No ___

33. Have you ever participated in asynchronous computer conferencing?  Yes ___ No ___
34. Do you use e-mail regularly?  
   Yes ___ No ___

35. Do you know what an electronic “bookmark” is and how to create one?  
   Yes ___ No ___

36. Have you ever participated in an online chat session?  
   Yes ___ No ___

III. Information items

Health information seeking stages

When you need health information, how much do you agree or disagree with the following statements that best describe you on a scale of 0: Strongly Disagree—4: Strongly Agree?

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Strongly Agree</th>
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<tbody>
<tr>
<td>0</td>
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<tr>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td></td>
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</tbody>
</table>

37. I don’t have specific issue, so I only pay attention to general health issues (e.g., President Clinton’s heart problem.).

38. I don’t have any urgent issue but would like to know about specific health issues to prevent or promote my health (e.g., I have a family history of breast cancer).

39. I have my personal health issue that I would like to go further on a diagnostic procedure (e.g., my doctor told me to test PSA.)

40. I have confirmed diagnosis that I would like to have further information on my treatment options (e.g., whether I can take OTC allergy medicine during my pregnancy).

General PIM activities

When you encounter important health documents about you or your family, how much do you agree or disagree with the following statements that best describe you on a scale of 0: Strongly Disagree—4: Strongly Agree.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
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<td>2</td>
<td>3</td>
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<tr>
<td>4</td>
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</tbody>
</table>

41. I put the documents in file folders.

42. I do normally scan my documents and save in computer or USB drive.

43. I do normally email my documents to myself.

44. I store copies of online payment information (e.g., bank, tax, purchasing, etc.) in my PC.

45. I use web-based service provided by my healthcare provider to manage my health documents.

PHIM (data) Needs

How often do you require the following information for use in your healthcare on a scale of 0: Never – 4: Always?

46. Personal identification, including name and birth date

47. Medical emergency contact (e.g., your family, your doctors, etc.)

48. Health insurance information

49. Living wills, advance directives, medical power of attorney, or organ donor authorization

50. Immunizations and their dates

51. Allergies or sensitivities to drugs or materials, such as latex

52. Family medical history (e.g., important events, dates, and hereditary conditions)

53. A list and dates of significant illnesses and surgical procedures

54. Current medications and dosages

55. Results from a recent physical examination

56. Correspondence between you and your provider(s)

57. Current educational materials (or appropriate web links) relating to your health

58. Physical exercise regimen, any herbal medications you take, and any counseling you may receive

59. Dietary practices (e.g., whether you are vegetarian or on a temporary diet)

PHIM stakeholder

How often do you acquire your health information from the following sources listed below on a scale of 0: Never – 4: Always?

<table>
<thead>
<tr>
<th>Never</th>
<th>Always</th>
</tr>
</thead>
</table>
60. Care providers (e.g., doctors, clinics, etc.)
61. Care payers (e.g., insurance, Medicare/Medicaid, etc.)
62. Pharmacies (e.g., local, online, etc.)
63. Medical Devices (e.g., thermometers, glucose meters, blood pressure cuffs, etc.)
64. Imaging lab (e.g., Radiology, Pathology, etc.)

IV. Activities

How often do you perform the following activities on a scale of 0: Never --- 4: Always?

<table>
<thead>
<tr>
<th>Activity</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collecting</td>
<td></td>
</tr>
<tr>
<td>65. I keep my health records (e.g., prescription, appointment reminders, x-ray images, lab results, etc.) for future reference.</td>
<td></td>
</tr>
<tr>
<td>66. I request copies of my health records from my healthcare providers, when necessarily. (e.g., insurance claims, employment, etc.)</td>
<td></td>
</tr>
<tr>
<td>67. I integrate multiple records from various health services (e.g., clinics, pharmacy, insurance, etc.)</td>
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</tr>
<tr>
<td>68. I remove my archived health information, when no longer needed.</td>
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<tr>
<td>69. I anticipate future use of my archived health records as referenced to my own or family health care.</td>
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</tr>
<tr>
<td>Organizing</td>
<td></td>
</tr>
<tr>
<td>70. I decide the most appropriate organizational strategy (e.g., folder location, name, sorting, etc.) for my health information for convenient future access.</td>
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<tr>
<td>71. I attempt to establish the mapping between my health information needs and information items such that future search and retrieval is facilitated.</td>
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<tr>
<td>72. I assign keywords that best describe topical contents of my health information (e.g., immunization, allergies, etc.).</td>
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<tr>
<td>73. I organize my health information by a classification scheme (e.g., years, events, doctors, hospitals, etc.)</td>
<td></td>
</tr>
<tr>
<td>74. I use Web applications (e.g., personal information management tool, social bookmarking, blogs, etc.) to organize my health information.</td>
<td></td>
</tr>
<tr>
<td>Searching</td>
<td></td>
</tr>
<tr>
<td>75. I know where to look for my health information, when needed.</td>
<td></td>
</tr>
<tr>
<td>76. I know how to narrow or broaden my search, when not satisfied.</td>
<td></td>
</tr>
<tr>
<td>77. I use appropriate meta-information (e.g., file name, folder location, etc.) to narrow the subsequent scan.</td>
<td></td>
</tr>
<tr>
<td>78. I know how to find helpful health resources from Internet or from my archives or from my providers.</td>
<td></td>
</tr>
<tr>
<td>79. I can distinguish which health resources are available on the Internet or from my care providers or my personal archive.</td>
<td></td>
</tr>
<tr>
<td>Sharing</td>
<td></td>
</tr>
<tr>
<td>80. I share my health information to support care for family members.</td>
<td></td>
</tr>
<tr>
<td>81. I share my health information with others through network drive (e.g., clouds, dropbox, etc.).</td>
<td></td>
</tr>
<tr>
<td>82. I share my clinical schedule (e.g., doctor appointments, medical procedures, or free time) through calendar explicitly with my clinical support staff.</td>
<td></td>
</tr>
<tr>
<td>83. I share my knowledge to educate my family members for health matters.</td>
<td></td>
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<tr>
<td>84. I express my opinions or exchange emotional supports on health issues on the Internet.</td>
<td></td>
</tr>
<tr>
<td>Understanding</td>
<td></td>
</tr>
<tr>
<td>85. I can articulate my health issues when I visit my doctors.</td>
<td></td>
</tr>
<tr>
<td>86. I understand my health information when discussing with my care providers.</td>
<td></td>
</tr>
<tr>
<td>87. I can tell high quality from low quality health resources on the Internet.</td>
<td></td>
</tr>
<tr>
<td>88. I can tell highly credible resources to support my healthcare decisions.</td>
<td></td>
</tr>
<tr>
<td>89. I can tell timely updated health information to support my health care decisions.</td>
<td></td>
</tr>
</tbody>
</table>
Using

90. I change my decisions or behaviors or life styles after I use my health information.
91. I know how to use my health information to answer my health conditions.
92. I feel confident in combining information from multiple sources to make optimal care decision.
93. I validate health information that I find on the Internet with my care providers.
94. I reduce healthcare cost by keeping my personal health information.

V. Barriers

To what extent, do you agree or disagree with the following statements about barriers of managing your health information on a scale of 0: Strongly Disagree --- 4: Strongly Agree?

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Strongly Agree</th>
</tr>
</thead>
</table>
| 0………………1……………2……………3……………4

Contents

95. High volumes of information to keep
96. Lack of accurate information to support care decision
97. Lack of up-to-date information to support efficient care
98. Scattered information at distant, multiple sites
99. Language used is not understandable (e.g., medical jargons, hand-writing, etc.)

Technology

100. Lack of technology to exchange information
101. Lack of controls on privacy, confidentiality, and access issues
102. Reluctance to adopt technology
103. Difficult navigation to locate information
104. Poor search functions to locate information

Knowledge

105. Lack of skills to organize information
106. Lack of knowledge to understand information
107. Lack of knowledge to identify valuable information
108. Lack of searching skills to locate information
109. Lack of memory to locate information

Resource

110. Lack of time to manage information
111. Lack of budget to manage information
112. Lack of people who can interpret information
113. Lack of spaces to keep information
114. Lack of Internet/Network connection

Cognitive

115. Resistance to share of personal health information
116. Lack of credibility for personal health information
117. Lack of privacy security about yourself and your health conditions
118. Lack of confidence about the benefits of personal health information.
119. Lack of cooperation from healthcare providers

VI. Features

For the following list of application features, how likely would you spend your resources (e.g., money, time, efforts, etc.) to manage your personal health information on a scale of 0: Very Unlikely --- 4: Very likely?
I would like to use the application:

**Basic – Scheduling/Billing**

120. To request, reschedule, referral or cancel appointments or directly book appointments.
121. To request prescription refills and renewals.
122. To obtain insurance information and pay bills securely.
123. To transfer my records to other care providers.
124. To collect medical bills eligible for tax deductions.

**Intermediate – View/Enter into PHRs**

125. To view my laboratory and imaging results.
126. To view my medical histories on treatments, medications, allergies, and immunization.
127. To respond to alerts and reminders sent by the practice.
128. To complete new patient registrations online.
129. To monitor and assess my preventive health behaviors.

**Advance – Analysis**

130. To search data on patients like me.
131. To receive enhanced surveillance or referral to genetic service based on my health records.
132. To better predict and anticipate my healthcare decisions.
133. To view patient educational materials.
134. To view information to manage the care of elderly parents, children, or spouse.

**Health Communication**

135. To send notes securely to physicians and/or office staff.
136. To communicate with others who are seeking similar information
137. To exchange emotional support
138. To prepare background information before visiting healthcare provider.
139. To request second opinion from other specialists.
Form M: Data Collection:

Part A: Pre-Survey

Screen 1: You’ve probably seen your chart at your doctor’s office. In fact, you may have charts at several doctors’ offices. If you’ve been in the hospital, you have a chart there, too. These charts are your medical records. They may be on paper or electronic. To keep track of all this information, it’s a good idea to keep your own personal health record. What kind of information would you put in a personal health record? You could start with

- Your name, birth date, blood type, and emergency contact information,
- Date of last physical,
- Dates and results of tests and screenings,
- Major illnesses and surgeries, with dates,
- A list of your medicines and supplements, the dosages, and how long you’ve taken them,
- Any allergies,
- Any chronic diseases, and
- Any history of illnesses in your family.

DEMOGRAPHICS

1. Enter your birth year. ___ ___ ___
2. What is your race/ethnicity that best describe yourself?
   a. White
   b. Hispanic
   c. Black or African American
   d. American Indian or Alaska Native
   e. Asian
   f. Native Hawaiian/Pacific Islander
   g. Other
3. Which category best describes your household’s annual income?
   a. Less than $9,999
   b. $10,000 to $24,999
   c. $25,000 to $49,999
   d. $50,000 to $69,999
   e. $70,000 to $99,999
   f. $125,000 to $149,999
   g. More than $150,000
4. What is your gender?
   a. Male
   b. Female
5. What is your highest degree earned?
   a. Middle school graduate (or equivalent)
   b. High school graduate (or equivalent)
   c. Some college (1-4 years, no degree)
   d. Associate’s degree
   e. Bachelor’s degree (BA, BS, etc)
   f. Master’s degree (MA, MS, etc)
   g. Professional or Doctorate degree (MD, JD, PhD, etc)
**PRIOR KNOWLEDGE**

Please indicate to what extent you agree with the following statements. For validation reasons, we may have to ask similar questions.

### Health Contexts (experience, knowledge, familiarity)

<table>
<thead>
<tr>
<th>Statement</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
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<tbody>
<tr>
<td>I had confirmed diagnosis.</td>
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<td>I know how the body works.</td>
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<td>I know bacteria can cause infection.</td>
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<tr>
<td>I had health conditions that require medical attention.</td>
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<tr>
<td>I took over-the-counter medicine on a regular basis.</td>
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<tr>
<td>I took prescription medicine on a regular basis.</td>
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<tr>
<td>I understand the nature and causes of my health condition(s).</td>
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<td>I understand medical words that my provider explains to me.</td>
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<td>I understand drug instruction (prescription, drug label, etc.)</td>
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<td>I understand medical instructions to do to take care of my health condition.</td>
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<tr>
<td>I understand the results of my blood test, x-ray, or other tests.</td>
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<td>I understand prognostic results of my illness.</td>
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<tr>
<td>I am familiar with medical vocabulary about my health condition(s).</td>
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<tr>
<td>I am familiar with health insurance policy and medical bills.</td>
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<tr>
<td>I am familiar with over-the-counter medicine to treat my condition.</td>
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<td>I am familiar with annual check-up procedure.</td>
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<td>I am familiar with specialist referral service.</td>
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<tr>
<td>I am familiar with adverse events of prescription medicine.</td>
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</table>

### General Computer (experience, knowledge, familiarity)

<table>
<thead>
<tr>
<th>Statement</th>
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<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
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</thead>
<tbody>
<tr>
<td>I received a file attachment from an incoming email message.</td>
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<tr>
<td>I installed software updates on my computer, if I need to.</td>
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<td>I took care of technical issues while using my computer.</td>
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<td>I filled out online form on a website.</td>
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<tr>
<td>I know how to share files through web storage.</td>
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<tr>
<td>I know how to share digital photos, videos, music.</td>
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<tr>
<td>I know how to find medical information, if I need to.</td>
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<tr>
<td>I know how to scan or save my medical information.</td>
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<tr>
<td>I am familiar with tagging keywords for photos or videos.</td>
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<tr>
<td>I am familiar with uploading and downloading my information.</td>
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<tr>
<td>I am familiar with which health information should be kept or removed.</td>
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<tr>
<td>I am familiar with evaluating the health resources I find on the Internet.</td>
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</tbody>
</table>

Every time
<table>
<thead>
<tr>
<th><strong>Information Management</strong> (experience, knowledge, familiarity)</th>
<th>Usually</th>
<th>Slightly Agree</th>
<th>Sometimes</th>
<th>Occasionally</th>
<th>Rarely</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>I made appointments with my provider(s) by e-mail or on a website.</td>
<td></td>
<td>1 2 3 4 5 6 7</td>
<td>8 9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I saw my provider(s) use a computer or handheld device to look up test results or other information about me.</td>
<td></td>
<td>1 2 3 4 5 6 7</td>
<td>8 9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I e-mailed my provider’s office and got an answer to my medical question.</td>
<td></td>
<td>1 2 3 4 5 6 7</td>
<td>8 9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I looked for my test results on the website that my providers provided.</td>
<td></td>
<td>1 2 3 4 5 6 7</td>
<td>8 9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I received a summary of my hospital visits by email or on a website.</td>
<td></td>
<td>1 2 3 4 5 6 7</td>
<td>8 9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I read hospital websites about health-related information for my care.</td>
<td></td>
<td>1 2 3 4 5 6 7</td>
<td>8 9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I know how to use computer for checking news, weather, or sports.</td>
<td></td>
<td>1 2 3 4 5 6 7</td>
<td>8 9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I know how to use computer for participating in social media services.</td>
<td></td>
<td>1 2 3 4 5 6 7</td>
<td>8 9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I know how to use computer for banking or paying bills or shopping.</td>
<td></td>
<td>1 2 3 4 5 6 7</td>
<td>8 9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I know how to use computer for searching for information.</td>
<td></td>
<td>1 2 3 4 5 6 7</td>
<td>8 9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am familiar with creating web pages or databases.</td>
<td></td>
<td>1 2 3 4 5 6 7</td>
<td>8 9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am familiar with word processing, presentation, spreadsheet applications.</td>
<td></td>
<td>1 2 3 4 5 6 7</td>
<td>8 9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am familiar with requesting copies of my medical records.</td>
<td></td>
<td>1 2 3 4 5 6 7</td>
<td>8 9</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>I am familiar with searching websites to find my health-related questions.</td>
<td></td>
<td>1 2 3 4 5 6 7</td>
<td>8 9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am familiar with posting my health-related questions on the websites.</td>
<td></td>
<td>1 2 3 4 5 6 7</td>
<td>8 9</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
RESOURCES
Please indicate to what extent you agree with the following statements. For validation reasons, we may have to ask similar questions.

<table>
<thead>
<tr>
<th>Limitations</th>
<th>Strongly Agree</th>
<th>Moderately Agree</th>
<th>Slightly Agree</th>
<th>Neutral</th>
<th>Slightly Disagree</th>
<th>Moderately Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I do not have sufficient insurance coverage.</td>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>I do not have any people to discuss about my health issues.</td>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
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<tr>
<td>I have cultural barriers preventing me sharing my health issues.</td>
<td>1 2 3 4 5 6 7 8 9</td>
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<tr>
<td>I have language barrier to understand health information.</td>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
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<tr>
<td>I have lack of education to comprehend medical instruction.</td>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
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</tr>
<tr>
<td>I have too much information at diverse places.</td>
<td>1 2 3 4 5 6 7 8 9</td>
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<tr>
<td>I have low budget to keep my health information.</td>
<td>1 2 3 4 5 6 7 8 9</td>
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<tr>
<td>I have technology barriers to search health information.</td>
<td>1 2 3 4 5 6 7 8 9</td>
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<tr>
<td>My providers do not offer electronic copies of my health records.</td>
<td>1 2 3 4 5 6 7 8 9</td>
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</tr>
<tr>
<td>I do not have enough time to organize my medical records.</td>
<td>1 2 3 4 5 6 7 8 9</td>
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</tr>
</tbody>
</table>
**CAPABILITIES**

Please indicate to what extent you agree with the following statements. For validation reasons, we may have to ask similar questions.

<table>
<thead>
<tr>
<th>Statement</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have a vision issue that prevents me reading.</td>
<td></td>
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<td>8</td>
<td>9</td>
</tr>
<tr>
<td>I have a hearing issue that prevents me understanding.</td>
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<td>8</td>
<td>9</td>
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<tr>
<td>I am not good at expressing my opinion verbally.</td>
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<td>8</td>
<td>9</td>
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<tr>
<td>I have short memory that prevents me understanding.</td>
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<td>8</td>
<td>9</td>
</tr>
<tr>
<td>Working with computers is boring and tedious.</td>
<td></td>
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<td>8</td>
<td>9</td>
</tr>
<tr>
<td>People who like computers are introverted and antisocial.</td>
<td></td>
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<td>8</td>
<td>9</td>
</tr>
<tr>
<td>No matter what I do, if I am going to get sick, I will get sick.</td>
<td></td>
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<td>8</td>
<td>9</td>
</tr>
<tr>
<td>It is my own behavior which determines how soon I get well again.</td>
<td></td>
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<td></td>
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<td>8</td>
<td>9</td>
</tr>
</tbody>
</table>
HEALTH LITERACY (SELF-RATING)

Please indicate to what extent you agree with the following statements. For validation reasons, we may have to ask similar questions.

<table>
<thead>
<tr>
<th>Rate your skills on:</th>
<th>Excellent</th>
<th>Satisfactory</th>
<th>Above neutral</th>
<th>Neutral</th>
<th>Below neutral</th>
<th>Needs Improvement</th>
<th>Unsatisfactory</th>
<th>Not applicable</th>
<th>Do not know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading comprehension</td>
<td>1 2 3 4 5 6 7</td>
<td>8 9</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Numerical computation</td>
<td>1 2 3 4 5 6 7</td>
<td>8 9</td>
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<td></td>
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<tr>
<td>Oral communication</td>
<td>1 2 3 4 5 6 7</td>
<td>8 9</td>
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<tr>
<td>Visual interpretation</td>
<td>1 2 3 4 5 6 7</td>
<td>8 9</td>
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<td></td>
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<tr>
<td>Internet searching</td>
<td>1 2 3 4 5 6 7</td>
<td>8 9</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Database searching</td>
<td>1 2 3 4 5 6 7</td>
<td>8 9</td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Mobile application</td>
<td>1 2 3 4 5 6 7</td>
<td>8 9</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Writing</td>
<td>1 2 3 4 5 6 7</td>
<td>8 9</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speaking</td>
<td>1 2 3 4 5 6 7</td>
<td>8 9</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Listening</td>
<td>1 2 3 4 5 6 7</td>
<td>8 9</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negotiation</td>
<td>1 2 3 4 5 6 7</td>
<td>8 9</td>
<td></td>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>
**Demand of Health-Related Stimulus**

Please indicate to what extent you agree with the following statements. For validation reasons, we may have to ask similar questions.

**Over the past 12 months, I received health-related information from the following sources:**

<table>
<thead>
<tr>
<th>Sources</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doctors, Pharmacist, Nurses (healthcare professionals)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>Family, Friends, Relatives, Colleagues</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>Hospitals or Clinics or Urgent Treatment Centers</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>Libraries, Patient Education Centers</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>Web sites</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>Pamphlets/Brochure, Posters, Flyers (hospitals, pharmacy, schools)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>Blogs, Wikis, Twitter, Facebook (social media service)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>Governments (at local or state or federal health departments)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>Insurance companies</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>Pharmaceutical companies</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>Mass media (TV, Radio, Newspaper, Magazines)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>Schools or Work</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
</tbody>
</table>
## Comprehension of the Stimuli

<table>
<thead>
<tr>
<th>Comprehension and Implementation</th>
<th>Strongly Agree</th>
<th>Moderately Agree</th>
<th>Slightly Agree</th>
<th>Neutral</th>
<th>Slightly Disagree</th>
<th>Moderately Disagree</th>
<th>Strongly Disagree</th>
<th>Not applicable</th>
<th>Do not know</th>
</tr>
</thead>
<tbody>
<tr>
<td>I understand my health information when discussing with my care providers.</td>
<td>1 2 3 4 5 6 7</td>
<td>8 9</td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>I interpret care instructions for other people (e.g., family, friends, etc.).</td>
<td>1 2 3 4 5 6 7</td>
<td>8 9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>I have the skills I need to evaluate the health resources I find on the Internet.</td>
<td>1 2 3 4 5 6 7</td>
<td>8 9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I can tell high quality from low quality health resources on the Internet.</td>
<td>1 2 3 4 5 6 7</td>
<td>8 9</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>I can tell highly credible resources to support my healthcare decisions.</td>
<td>1 2 3 4 5 6 7</td>
<td>8 9</td>
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</tr>
<tr>
<td>I can tell timely updated health information to support my health care decisions.</td>
<td>1 2 3 4 5 6 7</td>
<td>8 9</td>
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<td></td>
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</tr>
<tr>
<td>I am able to understand my medical bills.</td>
<td>1 2 3 4 5 6 7</td>
<td>8 9</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Health outcomes</td>
<td>Strongly Agree</td>
<td>Moderately Agree</td>
<td>Slightly Agree</td>
<td>Neutral</td>
<td>Slightly Disagree</td>
<td>Moderately Disagree</td>
<td>Strongly Disagree</td>
<td>Not applicable</td>
<td>Do not know</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>I changed my decisions or behaviors or life styles after I obtain health information.</td>
<td>1 2 3 4 5 6 7 8 9</td>
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</tr>
<tr>
<td>I used information from my care providers to make health decisions.</td>
<td>1 2 3 4 5 6 7 8 9</td>
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</tr>
<tr>
<td>I combined information from multiple sources to make optimal care decision.</td>
<td>1 2 3 4 5 6 7 8 9</td>
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</tr>
<tr>
<td>I validated health information that I find on the Internet with my care providers.</td>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
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</tr>
<tr>
<td>I validated health information that I receive from my care providers.</td>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
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</tr>
<tr>
<td>I reduced healthcare cost by keeping my health information.</td>
<td>1 2 3 4 5 6 7 8 9</td>
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</tr>
<tr>
<td>I improved my health condition after I obtained health information.</td>
<td>1 2 3 4 5 6 7 8 9</td>
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</tr>
<tr>
<td>I felt satisfied with health services after I obtained health information.</td>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
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</tr>
<tr>
<td>I improved my information management skills after I receive training.</td>
<td>1 2 3 4 5 6 7 8 9</td>
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</tbody>
</table>
**Form M: Health Literacy Assessment**

**Part B:**
This part of the assessment is used with the permission from Research Triangle Institute, North Carolina (Dr. Lauren McCormack).

**Screen 1:**
Thank you for taking the time to complete this survey. This survey includes questions on topics related to health and health care. First, you will read, view, or hear some health-related information. Then you will be asked some questions related to the information. The purpose of this survey is to find out what most people think and understand about some health care issues. If you do not know the answer to a question, then it is okay to check the box that says "Don't know." Some of the questions use names of people who are not real.

**Tips for Filling out the Questionnaire**

- All of your answers are kept private.
- Be sure to read all of the answer choices before marking your questions.

**Study Information:**
You are one of mTurk workers in the United States who are being asked to take a survey about topics related to health and healthcare. The questions are not meant to be sensitive, but if you feel uncomfortable answering a question you may skip it. The survey will take about 45 minutes to complete. In appreciation for your time, you will receive $1.50 per part for completing the three parts of health literacy test through mTurk payment system. You may complete a part of the assessment, if you wish so.

This test is being conducted by Sujin Kim, an associate professor of Division of Biomedical Informatics at University of Kentucky (Lexington, Kentucky, USA). This study is being sponsored by the University of Kentucky’s Academic Planning, Analytics, and Technologies office through the First APAT Research Grant. If you have any question about this survey, please contact Sujin Kim at sujinkim@uky.edu

**Possible Risks or Discomforts:**
You may refuse to answer any question or you may take a break at any time during the test. As with any other surveys you receive from University of Kentucky, the privacy and confidentiality of your information is of the highest importance, and we are committed to maintaining a secure environment for you in which to participate. Every effort will be made to protect your information, but this cannot be guaranteed. Neither your name nor your email address will be associated with your answers or used in any report.

**Benefits:**
Your responses are very important because they will help researchers understand how people perform tasks related to health and healthcare. Your response to the survey will be kept confidential to the extent allowed by law. When we write about the study you will not be identified. If you have questions about the study, please feel free to ask; our contact information is given below. If you have complaints, suggestions, or questions about your rights as a research volunteer, contact the staff in the University of Kentucky Office of Research Integrity at 859-257-9428 or toll-free at 1-866-400-9428.

**Screen 2:**
If you have read the previous screens and agree to participate, please click the Yes button, if not, click the No button. Select one answer only.

- □ Yes, I agree to participate.
- □ No, I do not agree to participate.

Now you will enter the test.
**Screen 3: Cholesterol: Know What Your Level Means**

Please answer the following questions based on the information in the text.

<table>
<thead>
<tr>
<th>Cholesterol: What Your Level Means</th>
<th>Total cholesterol level</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>What is cholesterol?</strong></td>
<td>• Less than 200 is best.</td>
</tr>
<tr>
<td>Cholesterol is a waxy substance the</td>
<td>• 200 to 239 is borderline high.</td>
</tr>
<tr>
<td>body uses to protect nerves, make cell</td>
<td>• 240 or more means a person is at increased</td>
</tr>
<tr>
<td>tissues and produce certain hormones.</td>
<td>risk for heart disease.</td>
</tr>
<tr>
<td><strong>Are there different types of cholesterol?</strong></td>
<td></td>
</tr>
<tr>
<td>Yes. Cholesterol travels through the</td>
<td>LDL cholesterol levels</td>
</tr>
<tr>
<td>blood in different types of packages,</td>
<td>• Below 100 is ideal for people who have a higher</td>
</tr>
<tr>
<td>called lipoproteins.</td>
<td>risk of heart disease.</td>
</tr>
<tr>
<td>Low-density lipoproteins (LDL) deliver</td>
<td>• 100 to 129 is near optimal.</td>
</tr>
<tr>
<td>cholesterol to the body. High-density</td>
<td>• 130 to 159 is borderline high.</td>
</tr>
<tr>
<td>lipoproteins (HDL) remove cholesterol</td>
<td>• 160 or more means a person is at a higher risk</td>
</tr>
<tr>
<td>from the bloodstream.</td>
<td>for heart disease.</td>
</tr>
</tbody>
</table>

Q1. If a person is at high risk for heart disease, which of the following levels of low density lipoprotein (LDL) cholesterol is **best**? Select one answer only.
   a. 102
   b. 86
   c. 129
   d. 155
   e. Not sure

Q2. Which set of low density lipoprotein (LDL) and high density lipoprotein (HDL) levels is **best**?
   a. LDL of 134 and HDL of 61
   b. LDL of 98 and HDL of 82
   c. LDL of 140 and HDL of 50
   d. LDL of 165 and HDL of 80
   e. Not sure
Q3. Which of the following problems could be caused by this medicine? Select one answer only.
   a. Trouble breathing
   b. Drowsiness
   c. Loss of appetite
   d. Trouble urinating
   e. Not sure
First-degree burns involve the top layer of skin. Sunburn is a first-degree burn.

**Signs:**
- Red
- Painful to touch
- Skin will show mild swelling

**Treatment:**
- Apply cool, wet compresses, or immerse in cool, fresh water. Continue until pain subsides.
- Cover the burn with a sterile, non-adhesive bandage or clean cloth.
- Do not apply ointments or butter to burn; these may cause infection.
- Over-the-counter pain medications may be used to help relieve pain and reduce inflammation.
- First degree burns usually heal without further treatment. However, if a first-degree burn covers a large area of the body, or the victim is an infant or elderly, seek emergency medical attention.

Second-Degree Burns

Second-degree burns involve the first two layers of skin.

**Signs:**
- Deep reddening of the skin
- Pain
- Blisters
- Glossy appearance from leaking fluid
- Possible loss of some skin

**Treatment:**
- Immers in fresh, cool water, or apply cool compresses. Continue for 10 to 15 minutes.
- Dry with clean cloth and cover with sterile gauze.
- **Do not** break blisters.
- Do not apply ointments or butter to burns; these may cause infection
- Elevate burned arms or legs.
- Take steps to prevent shock: lay the victim flat, elevate the feet about 12 inches, and cover the victim with a coat or blanket. **Do not** place the victim in the shock position if a head, neck, back, or leg injury is suspected, or if it makes the victim uncomfortable.
- Further medical treatment is required. **Do not** attempt to treat serious burns unless you are a trained health professional.

**Please answer the following questions based on the information in the text.**

Q4. Which of the following is probably **not** a second-degree burn? Select one answer only.

a. Blistering skin
b. Painful skin with a lot of swelling
c. Painful skin when touched with a little swelling
d. Skin that is leaking fluid
e. Not sure
Medical Center Information - audio recording
Please answer the following questions based on the information in the audio clip.

http://www.rti.org/files/hlsi/Phone-Menu-Recording_032609.wma

Click here if you would like to listen to the recording again.

Q5. If a person was worried about his cough, what number should he press? Select one answer only.
   a. 1
   b. 2
   c. 4
   d. Call 911
   e. Not sure

Q6. If a person wanted to check on the date and time of an appointment she already made, what number should she press? Select one answer only
   a. 1
   b. 2
   c. 4
   d. Call 911
   e. Not sure
Please answer the following questions based on the information in the map.

Q7. If John was visiting someone in room 130 and wanted to go to the cafeteria, which of these places would he pass if he took the shortest route? Select one answer only.

a. Diagnostic imaging  
b. Gift shop  
c. Cardiac center  
d. Emergency services  
e. Don't Know
Q8. Which of the following entrance is closest to the elevator? Select one answer only
   a. There is no elevator
   b. Surgery & Outpatient Center Entrance
   c. Rehabilitation Institute Entrance
   d. Main Entrance
   e. Don't Know

**Medicine Record**

<table>
<thead>
<tr>
<th>Name:</th>
<th>Birth date:</th>
</tr>
</thead>
</table>

--- Enter ALL prescription (Rx) medicine (include samples), over-the-counter (OTC) medicine, and dietary supplements ---

<table>
<thead>
<tr>
<th>Ex</th>
<th>XXXX</th>
<th>20 mg pill; small, white, round</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>40 mg; use two 20 mg pills</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Take orally, 2 times a day, at 8:00 am &amp; 8:00 pm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1-15-06; Lowers blood pressure; check blood pressure once a week; blood test on 4-15-06</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dr. X (800) 555-1212</td>
</tr>
</tbody>
</table>

Please answer the following questions based on the information in the chart.

Q9. In the example listed in the first row of the table, when should the medicine be taken. Select one answer only.
   a. Two times a day anytime between 8 a.m. and 8 p.m.
   b. At 8 a.m. or 8 p.m. each day
   c. At 8 a.m. and 8 p.m. each day
   d. Don't Know
Lactose intolerance: Why does milk bother me?

Lactose intolerance means that the body cannot digest foods with lactose in them. Lactose is the sugar found in milk and foods made with milk. Lactose intolerance is not serious. A person should feel better soon if they eat less food with lactose or if they use products that help them digest lactose. They cannot digest lactose because they do not have enough lactase enzyme. The small intestine needs lactase enzyme to break down lactose. If lactose is not digested, it can cause gas and stomach cramps.

After eating foods with lactose in them, some people may feel sick to their stomach. They may also have

- gas
- diarrhea
- swelling in your stomach

Some illnesses can cause these same problems. A doctor can tell a person if their problems are caused by lactose intolerance.

Please answer the following question based on the information above.

Q10. Which of the following is a symptom of lactose intolerance? Select one answer only

a. Constipation
b. Stomach ache
c. Sore throat
d. Heartburn
e. Don't Know
Calories burned
Please read the questions below, then visit the following website to answer the question. Answer the questions based on the information in the website.

http://www.healthwise.net/rtii/Content/StdDocument.aspx?DOCHWID=tx4394

Please answer the following question based on the information in the website.

Q11. John weighs 200 pounds and he walked at a medium pace on a firm surface for 30 minutes. How many calories did he burn? Select one answer only

a. 159  
b. 115  
c. 150  
d. 173  
e. Don’t Know

Q12. Kate weighs 150 pounds. Which activity would burn the most calories? Select one answer only

a. Walking at a medium pace for 30 minutes  
b. Raking the lawn for 30 minutes  
c. Bowling for 30 minutes  
d. Don’t Know
Risk of heart attack calculator
Please read the questions below, then visit the following website to answer the questions. Answer the questions based on the information in the website.


Interactive Tool: Are You at Risk for a Heart Attack?

What does this tool measure?

Click here to find your risk of heart attack.

This interactive tool measures your chance of having a heart attack in the next 10 years. The tool calculates your risk score from the values you enter. The calculation is based on information from the Framingham Heart Study. Since 1948 the Framingham Heart Study has studied the progression of heart disease and its risk factors. The data from this study has been used to make a risk assessment. This risk assessment was created by the U.S. National Cholesterol Education Program (NCEP), part of the National Institutes of Health and the U.S. Department of Health and Human Services.

The values you enter include the most important risk factors for heart disease. They are as follows:

- **Age and gender.** The number of people affected by heart disease increases with age in men after age 45 and in women after age 55.
- **Smoker.** Select "Yes" if you have smoked any cigarettes in the past month. Quitting smoking may be the most important step you can take to reduce your risk.
- **Systolic blood pressure.** Systolic blood pressure is the first number of your blood pressure reading. For example, if your reading is 120/80 (120 over 80), your systolic blood pressure is 120.
- **Blood pressure medicine.** Medicines used to treat high blood pressure include diuretics, angiotensin-converting enzyme (ACE) inhibitors, angiotensin II receptor blockers (ARBs), beta-blockers, calcium channel blockers, and direct renin inhibitors. Enter "Yes" if you take one of these medicines.
- **HDL cholesterol.** HDL, or high-density lipoprotein, is the "good" cholesterol because it helps prevent cholesterol from building up in your arteries. The higher your HDL, the better. An HDL of 60 mg/dL and above protects against heart disease. An HDL of less than 40 mg/dL puts you at major risk of heart attack.
- **Total cholesterol.** Total cholesterol is the sum of all the cholesterol in your blood. The higher your total cholesterol, the greater your risk for heart disease. A total cholesterol of 240 mg/dL and above puts you at twice the risk of heart disease compared with someone whose cholesterol is below 200 mg/dL. Less than 200 mg/dL gives you a lower risk for heart disease.

Please answer the following questions based on the information in the website.

Q13. What does this tool do? Select one answer only.
  a. Tells a person their chance of having a heart attack today
  b. Tells a person’s risk of having a heart attack over the next 10 years
  c. Tells a person the best way for a person to reduce their chances of having a heart attack
  d. Don’t Know
Q14. John is 39 years old and smokes. His blood pressure is 130/90 and he’s on blood pressure medicine. His HDL cholesterol is 50 and his total cholesterol is 230. What is his estimated 10 year risk of a heart attack?

a. 20 percent  
b. 12 percent  
c. 10 percent  
d. 2 percent  
e. Don’t Know
My mother is alive today because a police officer knew the signs of a stroke. You can save a life, too, if you learn these signs.

Mom was on her way to the dentist when a police officer noticed she was driving strangely and started to follow her. She pulled over on the highway. When the officer approached her, she told him she had a blinding headache. But she said that she had to get to her dentist appointment on time.

The officer also noticed that mom just wasn't acting right. Some of her speech was confused. And she was a little dizzy.

Mom said she felt fine, but that didn’t stop the officer. He quickly called 911. That call saved my mother’s life.

Knowing the signs of a stroke could help you save a life, too. Remember, some people have all of these signs, but my mom only had a few.

If you or someone else has even a few of these signs, get help fast!

Five Signs of a Stroke

• Sudden numbness or weakness of the face, arm or leg, especially on one side of the body
• Sudden confusion, trouble speaking or understanding
• Sudden trouble seeing in one or both eyes
• Sudden trouble walking, dizziness, or loss of balance
• Sudden, severe headache

American Stroke Prevention
Please answer the following question based on the information in the flyer.

Q15. Which of the following is NOT a sign of a stroke? Select only one answer.

a. Shaking chills  
b. Blurred vision  
c. Bad headache  
d. Numbness on one side  
e. Don’t Know
Portion Control for Weight Loss

Expanding portions

Are you eating a variety of healthy foods, exercising and still struggling with your weight? Some people may need to pay closer attention to portion control — managing the amount of food that they eat — as their total calorie intake determines their weight.

A serving isn't what they happen to put on their plate. It's a specific amount of food defined by common measurements, such as cups, ounces or pieces. The serving sizes represented here are part of the Mayo Clinic Healthy Weight Pyramid — a food pyramid designed to promote weight loss and long-term health. Use these serving sizes in conjunction with a diet based on a variety of healthy foods. Add the right amount of regular physical activity, and a person will be well on their way to enjoying good nutrition and controlling their weight.

Vegetables

Until they're comfortable judging serving sizes, you may need to use measuring cups and spoons. A half a cup of cooked carrots, for example, equals one serving. Here are the recommended serving sizes for other vegetables:

<table>
<thead>
<tr>
<th>Food</th>
<th>Serving size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw leafy vegetables</td>
<td>= 2 cups</td>
</tr>
<tr>
<td>Raw vegetables, chopped</td>
<td>= 1 cup</td>
</tr>
<tr>
<td>Chopped, cooked or canned vegetables</td>
<td>= 1/2 cup</td>
</tr>
</tbody>
</table>

Meat and beans

Familiar objects can help a person picture proper portions for meat, poultry, fish and beans. For example, a 3-ounce serving of fish is about the size of a deck of cards. Here are the serving sizes for meat and meat substitutes:

<table>
<thead>
<tr>
<th>Food</th>
<th>Serving size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooked skinless poultry or fish</td>
<td>= 3 ounces</td>
</tr>
<tr>
<td>Cooked lean meat</td>
<td>= 1 1/2 ounces</td>
</tr>
<tr>
<td>Cooked legumes or dried beans</td>
<td>= 1/2 cup or about the size of an ice cream scoop</td>
</tr>
<tr>
<td>Egg</td>
<td>= 1 medium</td>
</tr>
</tbody>
</table>
Please answer the following question based on the information in the text and charts.

Q16. A person is making a salad and wants to add one serving of chopped, uncooked carrots. How much should she use? Select only one answer.

a. 2 cups  
b. 1 cup  
c. ½ cup  
d. ¼ cup  
e. Don’t Know

Q17. A person is cooking dinner for himself and he wants to include one serving from the meat and beans group. What should he choose?

a. 1 ½ ounces of cooked lean beef  
b. 1 ½ ounces of cooked fish  
c. 3 boiled eggs  
d. 1 cup of cooked kidney beans  
e. Don’t Know
Obstructive sleep apnea – what happens? Please watch the video then go to the next screen.

Please watch the video then go to the next screen.

http://www.mayoclinic.com/health/obstructive-sleep-apnea/MM00715

15. Obstructive sleep apnea – what happens?
Please watch the video then go to the next screen.

Please answer the following question based on the information in the video clip.
Click here if you would like to watch the video again.

Q18. What do the muscles in the throat typically do when a person is sleeping?
Select one answer only.

a. Keep the throat as open as it is when a person is awake
b. Relax slightly and allow the throat to narrow but not close
c. Relax completely and allow the throat to close
d. Don’t Know
16. Lunge

Please watch the video below before proceeding to the next screen.

Please answer the following questions based on the information in the video clip.

http://www.mayoclinic.com/health/lunge/MM00723
Click here if you would like to watch the video again.

Q19. What parts of the body do lunge exercises work?
   a. Arms and shoulders
   b. Back and abdomen
   c. Legs and buttock
   d. Don't Know
Explanation of Benefits ABC Insurance Company

Plan Member: John Doe
Patient: Jane Doe

<table>
<thead>
<tr>
<th>Dates of service</th>
<th>Type of service</th>
<th>Submitted</th>
<th>Not covered</th>
<th>Covered</th>
<th>Co-pay</th>
<th>Plan liability</th>
<th>Patient responsibility</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>7/22/09</td>
<td>Physical therapy</td>
<td>140.00</td>
<td>0.00</td>
<td>140.00</td>
<td>140.00</td>
<td>0.00</td>
<td>140.00</td>
<td>A</td>
</tr>
<tr>
<td>7/15/09</td>
<td>Laboratory</td>
<td>170.00</td>
<td>66.00</td>
<td>104.00</td>
<td>30.00</td>
<td>74.00</td>
<td>30.00</td>
<td>B</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>310.00</td>
<td>66.00</td>
<td>244.00</td>
<td>170.00</td>
<td>74.00</td>
<td>170.00</td>
<td></td>
</tr>
</tbody>
</table>

Please answer the following questions based on the information in the chart.

Q20. How much will the insurance company pay for the physical therapy received on 7/22/09?

a. $140  
b. $100  
c. $40  
d. $0  
e. Not sure

Q21. How much does the patient have to pay for the laboratory services received on 7/15/09?

a. $104  
b. $74  
c. $66  
d. $30  
e. Not sure
Nutrition Facts

Serving Size 140 grams (140g)
Serving Per Container 1

**Food Nutrition Label**

<table>
<thead>
<tr>
<th>Amount Per Serving</th>
<th>Calories: 140</th>
<th>Calories from Fat 70</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Daily Value*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Fat</td>
<td>7g</td>
<td>11%</td>
</tr>
<tr>
<td>Saturated Fat</td>
<td>2.5g</td>
<td>13%</td>
</tr>
<tr>
<td>Trans Fat</td>
<td>0g</td>
<td></td>
</tr>
<tr>
<td>Cholesterol</td>
<td>25mg</td>
<td>8%</td>
</tr>
<tr>
<td>Sodium</td>
<td>300mg</td>
<td>13%</td>
</tr>
<tr>
<td>Total Carbohydrate</td>
<td>9g</td>
<td>3%</td>
</tr>
<tr>
<td>Dietary Fiber</td>
<td>2g</td>
<td>8%</td>
</tr>
<tr>
<td>Sugars</td>
<td>3g</td>
<td></td>
</tr>
<tr>
<td>Protein</td>
<td>8g</td>
<td></td>
</tr>
<tr>
<td>Vitamin A</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td>Vitamin C</td>
<td>20%</td>
<td></td>
</tr>
<tr>
<td>Calcium</td>
<td>4%</td>
<td></td>
</tr>
<tr>
<td>Iron</td>
<td>10%</td>
<td></td>
</tr>
</tbody>
</table>

Ingredients: Tomatoes; Chicken; Mushrooms; White Wine; Celery; Onions; Green Bell Pepper; Flour; Butter; Olive Oil; Salt; Black Pepper.

**Sherri Pinero, RD, www.recipeanalysis.com**

Please answer the following question based on the information in the label.

**Q22.** How many grams of fiber are in two servings? Select one answer only

a. 2
b. 3
c. 4
d. 5
e. Not sure

**Q23.** If a person is on a 2,500 calorie diet, what percent of the daily value of saturated fat would he get from one serving?

a. 10 percent
b. 11 percent
c. 12 percent
d. 13 percent
e. Not sure
Prostate Cancer

Please answer the following question based on the information in the chart.

Q24. More men die from prostate cancer than from other causes. Based on the chart above, would you say this is true, false, or are you not sure?
   a. True
   b. False
   c. Not sure

Q25. Based on the chart above, who is more likely to die of prostate cancer?
   a. White men
   b. African American men
   c. Both equally likely
   d. Neither
   e. Don’t Know
Form M: Data Collection – Health Literacy Assessment

Part C: Post-Literacy Test

Screen 1:
Thank you for taking the time to complete this survey. This survey includes questions on topics related to health and health care. First, you will read, view, or hear some health-related information. Then you will be asked some questions related to the information. The purpose of this survey is to find out what most people think and understand about some health care issues. If you do not know the answer to a question, then it is okay to check the box that says "Don't know." Some of the questions use names of people who are not real.

Tips for Filling out the Questionnaire
• All of your answers are kept private.
• Be sure to read all of the answer choices before marking your questions.

Study Information:
You are one of mTurk workers in the United States who are being asked to take a survey about topics related to health and healthcare. The questions are not meant to be sensitive, but if you feel uncomfortable answering a question you may skip it. The survey will take about 45 minutes to complete. In appreciation for your time, you will receive $1.50 per part for completing the three parts of health literacy test through mTurk payment system. You may complete a part of the assessment, if you wish so.

This test is being conducted by Sujin Kim, an associate professor of Division of Biomedical Informatics at University of Kentucky (Lexington, Kentucky, USA). This study is being sponsored by the University of Kentucky’s Academic Planning, Analytics, and Technologies office through the First APAT Research Grant. If you have any question about this survey, please contact Sujin Kim at sujinkim@uky.edu

Possible Risks or Discomforts:
You may refuse to answer any question or you may take a break at any time during the test. As with any other surveys you receive from University of Kentucky, the privacy and confidentiality of your information is of the highest importance, and we are committed to maintaining a secure environment for you in which to participate. Every effort will be made to protect your information, but this cannot be guaranteed. Neither your name nor your email address will be associated with your answers or used in any report.

Benefits:
Your responses are very important because they will help researchers understand how people perform tasks related to health and healthcare. Your response to the survey will be kept confidential to the extent allowed by law. When we write about the study you will not be identified. If you have questions about the study, please feel free to ask; our contact information is given below. If you have complaints, suggestions, or questions about your rights as a research volunteer, contact the staff in the University of Kentucky Office of Research Integrity at 859-257-9428 or toll-free at 1-866-400-9428.

1 The following assessment includes 25 items that test one’s health literacy skills and knowledge. The items presented are modified version of the National Assessment of Adult Literacy (NAAL) and Research Triangle Institute (RTI)'s Health Literacy Skills Instrument (HLSI).
Screen 2:
If you have read the previous screens and agree to participate, please click the Yes button, if not, click the No button. Select one answer only.

☐ Yes, I agree to participate.
☐ No, I do not agree to participate.

Now you will enter the test.
Cholesterol (American Health Association)

Please answer the following questions based on the information in the text.

What is Cholesterol?
- Cholesterol is a waxy, fat-like substance that occurs naturally in all parts of the body.

What is Total Cholesterol Score?
- Low density lipoproteins (LDL) are considered “bad” cholesterol. While they carry needed cholesterol to all parts of the body, too much LDL in the system can lead to coronary artery disease, due to the buildup of LDL deposits in the artery walls.
- High density lipoproteins (HDL) are called “good” cholesterol because they remove cholesterol from the bloodstream and the artery walls. A higher HDL score is desirable and will improve your overall cholesterol score.
- Triglycerides are a type of fat that is packaged with cholesterol when the lipoproteins form in the liver cells.

Q1. Which of the following levels of total cholesterol score is best?
   a. more than 100
   b. less than 200 (X)
   c. more than 200
   d. less than 100

Feedback: Less than 200 of total cholesterol score is optimal

High Blood Pressure

What is high blood pressure?
- Blood pressure is the force of your blood pushing against the walls of your arteries.
- Each time your heart beats, it pumps blood into the arteries.

How you measure your blood pressure?
- Your blood pressure is highest when your heart beats, pumping the blood. This is called systolic pressure.
- When your heart is at rest, between beats, your blood pressure falls. This is called diastolic pressure.
Your blood pressure reading uses these two numbers. Usually the systolic number comes before or above the diastolic number. A reading of

- A reading of 119/79 or lower is normal blood pressure
- 140/90 or higher is high blood pressure

Q2. Which of the following readings of blood pressure is regarded as high blood pressure?
   a. Between 110/100
   b. Less than 120/80
   c. More than 150/60
   d. 140/90 or higher (X)
   e. Not sure

**Feedback: 120/90 mmHg or higher.**

High Blood Pressure

Q3. Which of the following readings of blood pressure is regarded as normal blood pressure?
   a. Between 110/100
   b. Less than 120/80
   c. More than 150/60
   d. 140/90 or higher (X)
   e. Not sure

**Feedback: 120/90 mmHg or higher.**

Body Mass Index (SJK)

What is BMI?
- It is a number calculated from a person's weight and height. It provides a reliable indicator of body fatness for most people and is used to screen for weight categories that may lead to health problems.

Interpretation of BMI for adults
- For adults 20 years old and older, BMI is interpreted using standard weight status categories that are the same for all ages and for both men and women.
- For children and teens, on the other hand, the interpretation of BMI is both age- and sex-specific.

Please read the questions below, then visit the following website to answer the question.

Q4. Which of the following number is BMI of a person who is 5’3” and weighs 125 lbs is calculated?
   a. BMI is 26.1, indicating his/her weight is in the Overweight category for adults of his/her height.
   b. BMI is 22.1, indicating his/her weight is in the Normal category for adults of his/her height.
c. BMI is below 18.5, indicating his/her weight is in the Underweight category for adults of his/her height.
d. Not sure

Body Mass Index (SJK)

Please read the questions below, then visit the following website to answer the question.  

Q4. If you are 6'2" tall and weighs 210 lbs, which of the statement is true?
a. Your BMI is 27, indicating your weight is in the Overweight category for adults of your height.
b. Your BMI is 31, indicating your weight is in the Borderline category for adults of your height.
c. Your BMI is 22, indicating your weight is in the Normal category for adults of your height.
d. Not sure

Depression

The following summary is taken from the article titled, Treatment for Past Year Depression among Adults in 2008 by the National Survey on Drug Use and Health (NSDUH).

Treatment of Medical Depressive Episodes (MDE)
- In 2005 and 2006, an annual average of 67.4 percent of adults aged 18 or older who experienced a past year MDE received treatment for depression in the past year.
- Adult females who had experienced past year MDE were more likely than their male counterparts to have received past year treatment for depression (72.2 vs. 58.2 percent).
- Among adults who experienced past year MDE, those aged 50 or older were more likely than those in other age groups to have received treatment for depression in the past year (Figure 1).

Q5. Which of the following statement is true?
a. Among adults with MDE, those aged 35 to 49 were more likely than those in other older age groups to have received treatment for depression in the past year.
b. Among adults with MDE, those aged 18 to 25 were more likely than those in other older age groups to have received treatment for depression in the past year.
c. Among adults with MDE, the oldest group in this presented study were more likely than those in other age groups to have received treatment for depression in the past year.
d. Not sure

The following summary is taken from the article titled, Treatment for Past Year Depression among Adults in 2008 by the National Survey on Drug Use and Health (NSDUH).
Treatment of Medical Depressive Episodes (MDE)

- Among adults aged 18 or older with past year MDE who saw or talked to a medical doctor or other professional in the past year about depression, 40.5 percent reported that this treatment was extremely helpful or helped a lot, 29.2 reported that this treatment offered some help, and 30.2 percent reported that this treatment was of little help or no help at all (Figure 2).
- Adult females with past year MDE who saw or talked to a medical doctor or other professional about depression were more likely than their male counterparts to report that this type of treatment was extremely helpful or helped a lot (44.0 vs. 32.5 percent).
- There was no difference across age groups in the perceived helpfulness of talking to doctors or other professionals about depression.

Q6. Which of the following statement is true about the article summaries in the above table?
- a. Less than 30 percent reported that this treatment was extremely helpful or helped a lot,
- b. 29.2 reported that this treatment offered some help
- c. less than 10 percent reported that this treatment was of little help or no help at all.
- d. A little help or no help at all group is the most popular in this study sample
- e. Not sure

Over-the-Counter Medicine

Search a DailyMed database for “ADVIL (ibuprofen) capsule, liquid filled [Pfizer Consumer Healthcare].”

Q7. According to the information retrieved, Ibuprofen may cause a severe allergic reaction, especially in people allergic to aspirin. Which of the following problems could be caused by this medicine?
- a. hives
- b. sweeting (X)
- c. asthma (wheezing)
- d. blisters
- e. Not sure

Over-the-Counter Medicine

Over-the-counter drug label: Antihistamine
Q8. How many tablet(s), one should take if he is 16 years old?
   a. One tablet daily. (X)
   b. Two tablets every 24 hours.
   c. No more than 2 tablets a day.
   d. Less than 2 tablets daily.

Over-the-Counter Medicine (SJK)
Q9. Active Ingredients are the parts of the medicine that make it work. What is the thing the Drug Facts label tells you about the active ingredient(s) in this medicine?
   a. ibuprofen
   b. loratadine (X)
   c. lactose monohydrate
   d. magnesium stearate

Nutrition
Q10. Go to site at: http://www.choosemyplate.gov/myplate/index.aspx and enter the following information to calculate your recommended food consumption. (You are 22 years old, female college students, 5' 7" tall, 135 pounds, jogging 45 minutes daily.) What is the recommend food amount from each food group daily based on 2200 calorie food pattern?
   a. Aim for at least 3.5 ounces of whole grains a day.
   b. Limit your empty calories (extra fats & sugars) to 220 Calories.
   c. Aim for Dry Beans & Peas = 2 cups weekly
   d. Aim for 6 teaspoons of oils a day.

Nutrition

Q11. How many servings am I consuming if I eat this product?
   ◙ If you ate the whole package, you would eat two cups.
   ◙ If you ate 2 cups, you would eat 228 grams.
   ◙ If you ate the whole package, you would eat 220 calories.
   ◙ If you ate the whole package, you would eat 500 calories.

   Answer: The Serving Size: In the sample label, one serving of macaroni and cheese equals one cup. If you ate the whole package, you would eat two cups. That doubles the calories and other nutrient numbers, including the %Daily Values as shown in the sample label.

Q12. How many calories from fat are there in ONE serving?
   ◙ If you ate one serving, 200 would come from fat.
   ◙ If you consume two servings, 500 would come from fat.
   ◙ If you would consume 250 calories, 110 would come from fat.
   ◙ If you eat one serving, 250 would come from fat.
   ◙ If you ate the whole package, 110 would come from fat.

   Answer: Calories (and Calories from Fat), 110 calories, which means almost half the calories in a single serving come from fat. What if you ate the whole package content? Then, you would consume two servings, or 500 calories, and 220 would come from fat.
Prescription Medication Label

Q13. The label on your prescription bottle contains information from your doctor and your pharmacy about using your medication correctly. What is false statement about this dispensed drug?

a. Name of the drug is Metformin HCL TAB 1000 mg.
b. One cannot use this drug after 1 year.
c. This drug is liquid gel in round, White tablet. (X)
d. One cannot transfer of this drug to any person other than the patient for whom prescribed.

Q14. The label on your prescription bottle contains information from your doctor and your pharmacy about using your medication correctly. What is false statement about this dispensed drug?

a. Date the drug was filled by pharmacy is 10/24/2011.
b. This drug cannot be refilled until a doctor calls to pharmacy.
c. Manufacturer of this drug is Zygenerics.
d. NDC code for this drug is 683820003010.

Recorded hospital voice message

UK Ophthalmology clinics appointment.
Please answer the following questions based on the information in the audio clip. Click here (Link) if you would like to listen to the recording again.

Transcript: Thank you for calling the UK Healthcare Department of Ophthalmology. Our office hours are Monday to Friday, 8am to 5pm. If this is an emergency, please hang up and dial 911. If you are a referring physician, press 9. If you know your party’s 5-digit extension, dial it now. For all other calls, please select one of the following options so we can best direct your call to meet your needs. Your call may be recorded for quality assurance purposes. To schedule or cancel an appointment, press 1. To speak to a technician, press 2. For a prescription request, press 3. To reach the optical shop, press 4. For all other calls, press 5. Thank you for calling UK Healthcare.
Q15. If a person was referring physician, what number should he press?
Select one answer only
a. 1
b. 2
c. 9
d. Call 911
e. Not sure

Q16. If you wanted to check on the date and time of an appointment you already made, what number should you press?

a. 1
b. 2
c. 9
d. Call 911
e. Not sure

Q17. What is not true about requesting your medical records based on the information at: http://ukhealthcare.uky.edu/uploadedFiles/services-treatments/UHS/Parents/Release-of-Information-Form-parents.pdf

a. One can authorize the sharing of information about the diagnosis of treatment of AIDS, including results of HIV Tests (virus that causes AIDS).
b. One may revoke this Authorization at any time, unless the Authorization was given as a condition of obtaining insurance coverage.
c. One can request records related to X-ray report(s), pathology report(s), and psychological test report, only for insurance purpose. (X)
d. One can request records related to discharge summary, surgery report(s), and outpatient Notes for personal use.

Q18. What is not true about requesting your medical records based on the information given in the form below?

a. If patient is unable to sign, one can designate a legal representative to obtain the records.
b. Signing this authorization has nothing to do with his or her treatment, payment, enrollment in any health plan, or eligibility for benefits.
c. One can authorize to share his or her information about treatment an or consultation for mental health or psychiatric disorders for a certain period of time.
d. If information used or disclosed by this Authorization may be subject to re-disclosure again by the recipient but will be protected by applicable privacy law.

Recorded PodCast – Sports related injuries (SJK)

Q19. Listen to the following PodCast and answer the following questions based on the information given in the PodCast.


News and Numbers: Sports-Related Injuries Account for Most Child Emergency Department Visits
Rand: Now the numbers.

(music)

Rand: According to a recent study from AHRQ, sports-related injuries are a big reason why many kids end up in the emergency room. In fact, in 2006, 22 percent of hospital emergency department visits for kids ages 5 to 17 were due to sports-related injuries such as bruises, scrapes and broken bones. The most frequent visitors were boys, who had three times more visits than girls. Teens outnumbered children and were five times more likely to be treated in emergency departments. But fortunately, less than two percent of ER visits resulted in hospital admissions; most kids and teens were treated and released.

Q20. What is false about sports related injuries?

a. According to a recent study from AHRQ, sports-related injuries are a big reason why many kids end up in the emergency room.
b. **The most frequent visitors were girls, who had three times more visits than boys.**
c. Fortunately, less than two percent of ER visits resulted in hospital admissions.
d. In 2006, 22 percent of hospital emergency department visits for kids ages 5 to 17 were due to sports-related injuries such as bruises, scrapes and broken bones.

Q21. What is true about sports related injuries?

a. **The most frequent visitors were boys, who had three times more visits than girls.**
b. According to a recent study from AHRQ, sports-related injuries are a big reason why many kids end up in the long term care facility.
c. In 2006, more than 35 percent of hospital emergency department visits for kids ages 5 to 17 were due to sports-related injuries such as bruises, scrapes and broken bones.
d. Teens outnumbered children and were 10 times more likely to be treated in emergency departments.

Sexually transmitted diseases (STDs) - Medlineplus

Q22. Sexually transmitted diseases (STDs) are infections that you can get from having sex with someone who has the infection. Search MedlinePlus at: [http://www.nlm.nih.gov/medlineplus/](http://www.nlm.nih.gov/medlineplus/).

According to the information retrieved from MedlinePlus, how many types of STDs are included?

a. 10  
b. 15  
c. **20**  
d. 25  
e. Not Sure

Q23. Sexually transmitted diseases (STDs) are infections that you can get from having sex with someone who has the infection. Search MedlinePlus at: [http://www.nlm.nih.gov/medlineplus/](http://www.nlm.nih.gov/medlineplus/).

According to the information retrieved from MedlinePlus, what is not a type of STD related resources available to refine the original result set?

a. by Drugs and Supplements (23)  
b. **by Audiences**  
c. by Medical Encyclopedia (82)
d. by News (9)
e. by Multiple Languages (14)

Q24. Listen to the following video clip at: [https://www.youtube.com/watch?v=FPEHWN-ljhY](https://www.youtube.com/watch?v=FPEHWN-ljhY) and select CORRECT statements.

a. Health IT saves times by scheduling a doctor’s appointment.
b. Health IT help you with refilling prescriptions.
c. If your new doctor needs the results of a past checkup, you can use Health IT.
d. All of the above.

**Essential Personal Health Information Form**

### Medications
*Note: Include all prescription medications, (such as nitroglycerin) over-the-counter medications (taken on a regular basis), vitamin supplements, and herbal remedies.*

<table>
<thead>
<tr>
<th>Date</th>
<th>Medication / Dosage</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/3/2000</td>
<td>Amoxicillin 250mg tablets</td>
<td>2 tablets per day – after meals</td>
</tr>
<tr>
<td>1/25/2001</td>
<td>Aetaminophen with codeine 30mg (20 twenty)</td>
<td>1 tablet every 4 hours</td>
</tr>
<tr>
<td>1/2/2003 – 5/2/2004</td>
<td>Prenatal vitamin</td>
<td>1 tablet per day</td>
</tr>
</tbody>
</table>

Q25. Review the health information below that is entered by a patient for her own reference. How many medicines are prescribed since 1/1/2001?

- 1
- 2
- 3
- 4